TRANSACTIONS

OF THE

LINNEAN SOCIETY.

VOLUME IX.

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THE TRANSACTIONS OF THE LINNEAN SOCIETY OF LONDON.

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CONTENTS.

I. *The Genus Apion of Herbst's Natursystem considered, its Characters laid down, and many of the Species described. By the Rev.* William Kirby, *F.L.S.* - - p. 1

II. *Description of several Marine Animals found on the South Coast of Devonshire. By* George Montagu, *Esq. F.L.S.* - - - - - p. 81

III. *An Account of the Indian Badger; the Ursus indicus of Shaw's Zoology. By Lieutenant Colonel* Thomas Hardwicke, *F.L.S.* - - - - p. 115

IV. *A Botanical Sketch of the Genus Conchium. By* James Edward Smith, *M.D. F.R.S. P.L.S.* - p. 117

V. *An Inquiry into the Genus of the Tree called by Pona* Abelicea cretica. *By* James Edward Smith, *M.D. F.R.S. P.L.S.* - - - - p. 126

VI. *De-*

VI. *An Inquiry into the real Daucus Gingidium of Linnæus. By* James Edward Smith, *M.D. F.R.S. P.L.S.* p. 131

VII. *Descriptions of Eight New British Lichens. By* Dawson Turner, *Esq. F.R.S. A.S. and L.S.* - p. 135

VIII. *An Illustration of the Species of Lycium which grow wild at the Cape of Good Hope. By Sir* Charles Peter Thunberg, *Knight of the Order of Wasa, Professor of Botany at Upsal, F.M.L.S.* - - - p. 151

IX. *Some Observations on an Insect that destroys the Wheat, supposed to be the Wireworm. By* Thomas Walford, *Esq. F.A.S. and L.S. With an additional Note, by* Thomas Marsham, *Esq. Treas. L.S.* - - p. 156

X. *An Account of the larger and lesser Species of Horse-shoe Bats, proving them to be distinct; together with a Description of Vespertilio Barbastellus, taken in the South of Devonshire. By* George Montagu, *Esq. F.L.S.* p. 162

XI. *Description of two new Species of Didelphis from Van Diemen's Land. By* G. P. Harris, *Esq. Communicated by the Right Honourable Sir* Joseph Banks, *Bart. K.B. Pres. R.S. H.M.L.S.* - - - p. 174

XII. *Description of a Species of Dimorpha. By* Edward Rudge, *Esq. F.R.S. and L.S.* - - p. 179

XIII. *Some interesting Additions to the Natural History of Falco cyaneus and pygargus, together with Remarks on some other British Birds. By* George Montagu, *Esq. F.L.S.* - - - - - p. 182

XIV. *An Account of some new Species of Piper, with a few cursory Observations on the Genus. By Mr.* John Vaughan Thompson. *Communicated by the Right Hon.* Lord Seaforth, *F.R.S. and L.S.* - - p. 200

XV. *An Inquiry into the Structure of Seeds, and especially into the true Nature of that Part called by Gærtner the Vitellus. By* James Edward Smith, *M.D. F.R.S. P.L.S.* - - - - - p. 204

XVI. *Observations on Nauclea Gambir, the Plant producing the Drug called Gutta Gambeer, with Characters of two other Species. By* William Hunter, *Esq. Secretary to the Asiatic Society. Communicated by the President.* p. 218

XVII. *Observations respecting several British Species of Hieracium. By* James Edward Smith, *M.D. F.R.S. P.L.S.* - - - - - p. 225

XVIII. *Specific Characters of the Decandrous Papilionaceous Plants of New Holland. By* James Edward Smith, *M.D. F.R.S. P.L.S.* - - - - p. 244

XIX. *On the Variegation of Plants. In a Letter to* Richard

Anthony

Anthony Salisbury, *Esq. F.R.S. and L.S. by* Thomas Andrew Knight, *Esq. F.R.S. and L.S.* - p. 268

XX. *Characters of Hookeria, a new Genus of Mosses, with Descriptions of Ten Species. By* James Edward Smith, *M.D. F.R.S. P.L.S.* - - - p. 272

XXI. *Description of Notoclea, a new Genus of Coleopterous Insects from New Holland. By* Thomas Marsham, *Esq. Tr. L.S.* - - - - p. 283

XXII. *Some Remarks on the Plants now referred to Sophora, with Characters of the Genus Edwardsia. By* R. A. Salisbury, *Esq. F.R.S. and L.S.* - - p. 296

XXIII. *Characters of Platylobium, Bossiæa, and of a new Genus named Poiretia. By* James Edward Smith, *M.D. F.R.S. P.L.S.* - - - - p. 301

XXIV. *Musci Nepalenses; or Descriptions of several new Mosses from Nepal. By* William Jackson Hooker, *Esq. F.L.S.* - - - - - p. 307

XXV. *Extracts from the Minute-Book of the Linnean Society of London* - - - - p. 323

Catalogue of the Library of the Linnean Society, continued from Page 362 *of Vol. VIII. of the Society's Transactions* - - - - - p. 326

List of Donors to the Library of the Linnean Society p. 329

TRANS-

TRANSACTIONS

OF THE

LINNEAN SOCIETY.

I. *The Genus Apion of Herbst's Natursystem considered, its Characters laid down, and many of the Species described. By the Rev. William Kirby, F.L.S.*

Read June 4, 1805.

THERE are certain tribes of insects, the species of which are so slightly marked by any apparent difference of size, shape, or colour, that, for want of sufficient examination, many are set aside as mere varieties, which, when they are minutely inspected, exhibit characters very strong and discriminative. Amongst these there are none more liable to be confounded, or that occasion more trouble to the entomologist, who wishes to be accurately acquainted with them, than those minute Weevils, which, in Herbst's *Natursystem*, under the name of *Apion*, are considered as a separate genus from *Curculio**: they constitute Mr. Marsham's second section of his first division of his first family of that genus†, and are arranged by Fabricius, and after him

* Tom. vii. *p.* 100. tab. 102, 103. *and Q, fig.* 6. 7. 8.

† Viz. A. a. * *. Longirostres *Antennis integris femoribus simplicibus abdomine ovato acuto, rostro filiformi, thorace teretiusculo.* Nudiusculi.

by

by Latreille*, Paykull, Panzer, &c. under *Attelabus*, from which, however, they essentially differ.

Every collector must have observed the insects of which I am speaking, for they abound every where upon plants; but, from the extreme similarity of the species to each other, in all the particulars mentioned above, most would be disposed to confound them together. There are, however, a great many distinct species of them; of which, although a considerable number have already been described, many still remain that have hitherto escaped notice.

Having, for some time, been accustomed to examine these minute insects with close attention, I found myself possessed of several nondescript British species; and, in addition to these, my collection has been enriched by the liberality of an ingenious and learned correspondent, major Gyllenhal, (to whom Paykull was under very great obligations) with several specimens from Sweden, which have enabled me to ascertain many of those described by Fabricius, Paykull, and others, concerning which I was before in doubt. Add to this the happy opportunity, indulged to me by the kindness of our President, of inspecting the Linnean Cabinet. All these circumstances induce me to

* I cannot mention the name of this learned entomologist and not notice the remarkable coincidence which, without any previous communication between us upon the subject, is observable between his excellent *Division des Abeilles* (*Hist. Nat. des Fourmis, p.* 401—38.) and my Monograph upon the same genus. That both of us, with little variation, should fix upon the same general divisions and subdivisions, is a strong proof that our only aim has been to trace the labyrinth of nature; and that, as far as our researches have been carried, we have succeeded in our attempt: or, to use the words of this gentleman upon the occasion, "*Une telle ressemblance dans le fruit des nos recherches prouve évidemment que la Nature, qui est une, a été notre guide.*" (*Hist. Nat. gen. et partic. des Crustacés et des Insectes,* tom. iii. *p.* 369—371. *note* 1. where see our respective methods compared.)

hope

hope that I may render some small service to entomology, if I offer to the Linnean Society a few observations upon this difficult genus or family, accompanied by more elaborate descriptions than have yet been given of such of the species as I am acquainted with; for it has been the fate of the smaller and less conspicuous insects, to be described, generally speaking, with less care and minuteness than the larger, or those that are distinguished by more prominent features; whereas, in fact, the former, that they may not be confounded with their affinities, stand most in need of having all their peculiarities noticed: on this account, and to prevent future mistakes, I have described anew all the species that have come under my eye.

In general, these insects are distinguished by a slender subcylindrical rostrum; which, when unemployed, is not pressed close to the breast between the fore-legs, as is the case with many genuine curculios*, but stretches out from the head, or is porrect (if I may employ such a term) and arching downwards: their antennæ are not broken, as in the cognate genus just mentioned, but entire; and terminate in a lanceolate knob, consisting of three closely joined and scarcely visible articulations; the thorax inclines to the figure of a truncate cone, but now and then it is rather spherical, and often nearly cylindrical; and the abdomen is more or less ovate; so that the whole insect, in shape, bears considerable resemblance to a pear, the rostrum being regarded as the stalk.

More particularly, the species afford to the describer the following circumstances for distinctive characters:—

The *Rostrum* is either shorter than the head and thorax taken together, of the same length, or longer; and with respect to this circumstance I term it—*Rostrum brevius, mediocre, longius:* its

* e. g. Rhynchænus *Fabr. Syst. Eleuth.* ii.

thickness

thickness or tenuity will furnish other notes of difference, and whether either of these is partial or general.

The *Antennæ*, also, compared with the rostrum, are *breviores*, *mediocres*, *longiores*; and their insertion is either behind the apex, at the middle, behind the middle, or at the base of the rostrum; on which account they may be denominated *anticæ*, *mediæ*, *posticæ*.

The *Head*. The space between the eyes affords some very good, though very minute, characters, hitherto unnoticed, except by Herbst, and by him only with respect to a single species*: it is either punctulate, rugulose, canaliculate, or striate; and, besides this, it is now and then hollowed out into a concavity†.

The *Eyes* are sometimes prominent, at others subimmersed.

The *Trunk* often forms nearly a perfect cylinder, but more commonly a truncate cone; now and then it approaches to a spherical figure; it is usually rough, with very minute impressed points; and, besides, it is often distinguished by a dorsal channel or furrow running nearly its whole length; or an abbreviate one; or a larger excavate point just above the scutellum.

The *Abdomen*, covered by the elytra, is either globose, obcuneiform, ovate, obovate, oval, or oblong.

The *Elytra* are either furrowed or striate; and the furrows, or *striæ*, are punctate or impunctate, with interstices either plane or convex.

Add to all these circumstances pubescence and the variations of colour; and there will appear no want of characters to discriminate these little insects from each other.

* Viz. *Apion sulcifrons*, tom. vii. *p*. 132. *n*. 25. tab. 103. fig. 12—*M*.

† N. B. To see these minute characters, it is often requisite to use two of the glasses of a pocket microscope.

Having

Having mentioned the peculiarities which most strikingly characterize the species, I shall next inquire with what propriety they may be regarded as belonging to a distinct genus.

Linné considered all insects furnished with antennæ seated upon a rostrum (a few of his *Attelabi* excepted) as belonging to one genus; but whoever studies the species attentively, which will arrange under his *Curculio*, will be convinced that this circumstance is characteristic of a section of the order of *Coleoptera*, rather than of a natural genus. To name no other part, the antennæ, confessedly of the greatest importance in determining the genus of insects, vary surprisingly in this numerous tribe: thus in *Calandra*, *Rhynchænus*, *Lixus*, *Cossonus*, and *Curculio*, of Fabricius's *Systema Eleutheratorum*, and in the insects we are now considering, they are subcapitate or terminate in a knob: in *Brentus*, of the same work, they are moniliform: in *Anthribus* and the genuine *Attelabi*, they are subclavate, with a distinctly jointed clava: in *Rhinomacer* they are either setaceous or filiform; and in *Brachycerus* they grow gradually larger from the base to the apex. Great differences are likewise observable in those that have capitate antennæ; in some the terminating knob is jointed, for the most part transversely, with an acute summit; in others it is solid; of this description I remember noticing a very singular one in the cabinet of the ingenious Mr. Donovan, in which this part, compared with the size of the insect, was immensely large, transverse, and oblong*. Another and striking difference takes place in antennæ of this description: in those which I consider as genuine curculios, the first joint is nearly as long as

* In *C. Palmarum*, Linn. the knob is of a singular shape; it is solid, calceoliform, transverse, and connected with the stalk at one end: the upper part at first sight appears truncate, but if it be closely examined it will be found prismatic, or, in Linné's words, *Antennæ apice quasi bifariam truncatæ*.

all

all the rest put together, with which it forms an angle, so as to make the antennæ wear the appearance of being broken; while in the genus of which I am now treating the first joint is not so remarkably longer than the rest, and is always in the same line with them.

If these circumstances be allowed their due weight, we shall feel disposed, I think, to give Fabricius credit for great discernment, when he considered the Linnean character of *Curculio* as indicating the division of an order rather than a genus: whether he has with equal propriety placed the little insects in question in his genus *Attelabus* must be our next inquiry.

Attelabus of Linné is an intermixture of genera scarcely, if at all, related to each other, concerning which that great father of Natural History himself observes: *Genus* Attelabi *etiamnum inter obscura est nec aptius reperi**. Fabricius, with great judgment, has excluded *At. surinamensis, melanurus, formicarius, sipylus, apiarius, mollis, ceramboides* and *buprestoides*, which certainly have no connection with it, and in their place introduced all the curculios which constitute Mr. Marsham's two first families†, and these are evidently more nearly allied to *At. Coryli, Avellanæ, curculionoides*, &c. than those just mentioned: still, however, *At. Coryli* and *Avellanæ* (which are certainly distinct species, though Fabricius has united them) differ essentially not only from *Curculio Betulæ, Populi, Bacchus*, &c. Linn., but also from *At. curculionoides* and *Betùlæ*; so that there seems to be some reason for Herbst's making a distinct genus, as he does, under the name of *Rynchites*, of many of the Fabrician *Attelabi*. In these insects, I mean *At. Coryli* and *Avellanæ*, the clava of the antennæ is not so distinctly jointed, the head is elongate, nearly obconical, and connected with the thorax by a narrow neck; the

* *Syst. Nat. Ed.* 12. *p.* 619. *Note.*

† *Viz.* A. a. *. **

eyes

eyes are very prominent; the trunk is obversely funnel-shaped; and the tibiæ, at the apex, are armed with a single crooked spine: on the contrary, in *At. Betulæ, curculionoides,* and the curculios of Mr. Marsham's first family, the antennæ have a subperfoliate clava with very distinct joints; the head has no separate neck, nor is it elongate or obconical; the trunk, in most, is subglobose; and the apex of the tibiæ without spines: but in *At. curculionoides,* which seems intermediate between *At. Coryli* and *Betulæ, Populi,* &c. the trunk inclines rather to a square form; and the apex of the tibiæ is armed with two spines.

But these insects are all more nearly related to each other than they are to the tribe of which I am now speaking, although Fabricius and most others have confounded them together. Mr. Marsham and Herbst seem to be the only entomologists whose penetration has detected the difference between them*. I shall therefore

* The ingenious author of *Entomologie Helvétique,* whose work I had not had an opportunity of consulting when this passage was written, has separated the species that belong to Mr. Marsham's first and second families of *Curculio* from *Attelabus,* Fabr. and given them, after Geoffroy, as a distinct genus (*Rhinomacer*) which he has divided into three families. The first contains the greater proportion of the species of *Apion*; the second, those that have a rostrum attenuate at the apex, like *Ap. Craccæ*; and the third, the species that constitute Mr. Marsham's first family; e. g. *Curc. Populi, Bacchus,* &c.

M. Latreille also, in the work before quoted, (of which I had then only seen those sheets which relate to my Monograph upon *Apis,* Linn.) divides *Attelabus,* Fabr. into two families, each of which he further subdivides into two sections. Thus,

"Genre. ATTELABE. Antennes de onze articles, dont les derniers forment une massue perfoliée. Pénultième article des tarses bilobé.

"* Jambes antérieures terminées par une ou deux fortes épines. Trompe très courte, épaisse, rétrécie au milieu.

"† Tête alongée, rétrécie et dégagée postérieurement. Corselet tubulé en devant, presque conique, recevant le cou qui est en forme de genou. Exemple. *Attelabus Coryli,* Linn.

"†† Tête

therefore compare them with the Fabrician character of *Attelabus*, and point out in what particulars they vary from it*.

With respect to the *Instrumenta cibaria*, it is doubtful whether Fabricius, or any other entomologist, ever saw distinctly those of the insects of which I am speaking; the rostrum, in which they are hidden, is so very slender and minute, that it is scarcely possible to extricate them from it, at least my endeavours to do this, which have been employed upon some of the largest species I know, have not as yet been successful: the maxillæ (*Mandibulæ*, Fabr.) when it accidentally happens that one is exerted, may just be discerned under a strong magnifier; they appear to be acute and incurved, and I believe there may be four palpi; but their shape and number of joints I have not been able to ascertain, therefore I cannot say whether they are filiform or not, or the valvulæ (*Maxillæ*, Fabr.) bifid. The remaining particulars (viz. "*Rostrum elongatum incurvum, Antennæ extrorsum crassiores,*" if we consult his *Essential Character* in the scale of genera, or "*Antennæ moniliformes rostro insidentes,*" which is part of his *Artificial Character* at the head of the genus) we can more readily compare with the characters which our insects exhibit. The

"† † Tête sans rétrécissement postérieur, s'enfonçant plus ou moins dans le corselet, qui est presque carré ou trapézoïde. Ex. *Att. curculionoides,* Linn.

"** Jambes antérieures sans épine remarquable à leur extrémité.

"† Trompe élargie au bout. Antennes insérées plus en dessus qu'en dessous. Abdomen carré. Ex. *Curc. Bacchus,* Linn.

"†† Trompe plus étroite au bout, ou n'étant pas plus large qu'ailleurs. Antennes insérées plus en dessous qu'en dessus. Abdomen presque globuleux. Ex. *Attel. Craccæ, flavipes, frumentarius,* F."

Hist. Nat. gen. et part. des Crustacés et des Insectes, tom. iii. *p.* 196, 197.

* CHAR. ESSENT. *Rostrum* elongatum, incurvum. *Maxilla* bifida. *Antennæ* extrorsum crassiores. *Syst. Eleuth.* i. xi.

CHAR. ARTIFIC. *Palpi* filiformes. *Maxilla* bifida. *Antennæ* moniliformes, rostro insidentes.

terms

terms by which he has defined the rostrum apply better to them than they do to the true *Attelabi*, *Att. Coryli*, &c. (whose rostrum cannot, with propriety, be called either *elongatum* or *incurvum*); but *antennæ extrorsum crassiores* will by no means agree with the antennæ of *Apion*, which terminate in a little head or knob, although it may suit *Attelabus* tolerably well, in which the knob is not so distinct; yet Linné's term for the antennæ of *Curculio* (*subclavatæ*) would better define them. The term *moniliformes*, if applied only to the stalk of the antennæ, appears to be tolerably accurate; yet even in this part the joints, if very closely examined, will be found somewhat conical, or subturbinate, rather than spherical. Besides these differences, the rostrum of our insects is not dilated, as in the other *Attelabi*, at the apex; the trunk is not spherical; and the elytra, taken together, are rarely, if ever, quadrangular. The *Attelabi* likewise, for the most part, inhabit trees and the taller shrubs; whereas herbs and under-shrubs, and more particularly the class *Diadelphia*, are the most usual food of the species of *Apion*.

Whether it be advisable to separate this genus from *Curculio* will admit of another question; but, since this is the connecting link between that genus and *Attelabus*, it seems to me that it ought to be considered as distinct from both: the most essential character of the genuine *Curculio* is its broken antennæ, whose ten last joints form an angle with the first or elongate one; whereas these little insects, though they borrow the terminating knob from the latter genus, have unbroken antennæ like the former. There are a few curculios* (to show how the genera shade into each other) which are intermediate between that genus and *Apion*, whose antennæ, though the first joint is elongate, can

* C. atramentarius, *Marsh. Ent. Brit.* i. 293. 16. C. Cerasi, *ibid.* 265. 83. and C. Pruni, *ibid.* 247. 24.

neither

neither be called entire nor broken, but between both, *subfractæ.* This confirms an observation which I made in a former work, "that the connecting links between two proximate genera usually borrow their characters from both*."

Herbst has called this genus *Apion*, because, in shape, it somewhat resembles *a pear*; I retain this name from my dislike of change, although a Greek termination in a Latinized word is rather awkward. *Apium*, indeed, was before engaged in botany, but perhaps its diminutive, *Apiolum*, might have done. I once had called this little genus *Eurhynchus*, from ευ *bene*, and ῥυγχος *rostrum*.

Herbst gives no generic character of *Apion*, but details most of its peculiarities†. I shall therefore endeavour to supply this deficiency, by constructing its *Essential*, *Artificial*, and *Natural Characters*.

APION.

Character Essentialis.

Antennæ integræ, subcapitatæ: capitulo ovato-lanceolato acuto subsolido, rostro elongato insidentes.

Character Artificialis.

Antennæ integræ, subcapitatæ: capitulo subsolido.
Rostrum sæpiùs porrectum, elongatum, subcylindricum.
Truncus teretiusculus.
Tibiæ apice inermes.
Corpus pyriforme *.

Character Naturalis.

CORPUS pyriforme, sæpiùs glabrum, interdum at subpubescens, crustâ cataphractum.

* *Monogr. Ap. Angl. tom.* i. *p.* 48.

† *Natursyst. &c. tom.* vii. *p.* 100.

Caput

Caput thoraci insertum, parvum.

Os in rostrum productum plerumque attenuatum, arcuatum, subcylindricum, porrectum.

Maxillæ sub rostri apice insertæ, retractæ, brevissimæ, simplices, incurvæ, acutæ.

Lingua, unà cum valvulis palpisque quatuor, intra rostrum latitans haud conspicua.

Antennæ rostro insidentes capitatæ, nitidiusculæ, pilosulæ, 11-articulatæ: articulis duobus baseos crassioribus; primo clavato elongatiori, secundo conico, proximis sex brevissimis æqualibus ex conico rotundatis seu subturbinatis, ultimis tribus majoribus, arctissimè connexis capitulum ovato-lanceolatum acutum formantibus.

Oculi laterales, rotundi, convexi, reticulati.

Nucha glaberrima, retractilis.

Gula tumidula, glaberrima, retractilis.

Truncus angustus, teretiusculus.

Thorax, trunci dorsum, punctulatissimus.

Pectus, trunci pars prona antica, suturâ nullâ a thorace distinctum.

Sternum acutum integrum, inter pedum intermediorum basin delitescens.

*Epigastrium**, trunci pars prona postica, dilatatum, a pectore incisurâ profundâ separatum, abdomini arctiùs incumbens, valdè convexum: puncto intermedio majori seu umbilico notatum; elytrorum dimidio anteriori supernè tectum.

* I have adopted this anatomical term to denote a part which has generally been confounded with the *Pectus*, but which is separated from it by a deep incisure, and frequently, in other genera, requires distinct notice.

Pedes elongati, cursorii, anteriores intermediis, intermedii posterioribus sub-breviores: apophysi seu coxæ biarticulatæ; articulo primo conico majori, secundo obconico minori, insidentes; anteriores duo seu manus pectori inserti antrorsum tendunt, posteriores autem quatuor ex epigastrio provenientes anum versùs.

Femora clavata.

Tibiæ subcompressæ, tenues, a basi sensim crassiores, apice inermes*.

Tarsi omnes 4-articulati, subtus pulvinati: articulis duobus primis conicis, penultimo majori obcordato bifido, ultimo minuto ascendente glabro unguiculato: unguiculis duobus incurvis.

Scutellum minutissimum, subtriangulare.

Elytra rigida, acuta, convexa, sulcata vel striata: striis exterioribus et interioribus sæpiùs posticè confluentibus.

Alæ membranaceæ, corpore longiores, transversè plicatæ: plicis tribus; anticè binervia: nervulis longitudinalibus, basi et apice approximatis†.

Abdomen ovatum: segmentis 5 seu 6; duobus anticis majoribus, intermediis angustissimis, ultimo longiori acuto.

* De Geer (*tom.* v. *p.* 201), speaking of *Curculio* Linn., makes the following observation: " *Les jambes de toutes les trois paires ont cela de particulier, que, dans toutes les espèces, elles ont en dessous de leur extremité un ongle ou un crochet pointu, tres dur et courbé en dessous——Ce crochet des jambes pourroit fort bien entrer dans le caractère generique de ces insectes.*" This observation must have been made after a partial examination, since we have seen above that some *Attelabi* have two spines, and all the species of *Apion* have none.

† Obs. " *In quibusdam nervuli insuper duo (sed haud facile conspiciuntur) a medio alæ usque ad ejus apicem divergunt.*"

Obs.

Obs.—*Mas vix a feminâ differt, nisi rostro breviori et paulò crassiori.*

LARVA apoda, anticè subtus loco pedum tuberculis tribus utrinque instructa, mollis, annulata, plicata*.

PUPA folliculata, ovata, lævis.

VICTUS *Larvæ* plantarum semina sæpiùs diadelphicarum, *Imaginis* autem folia.

TEMPUS inter æquinoctem vernalem et autumnalem.

Linné, in his *Fundamenta Entomologiæ*, defines the *Truncus* to be that part "*qui pectus seu thoracem comprehendit, inter caput et abdomen cui pedes inserti*;" yet in all *coleopterous* insects, and many of the other orders, the part which I have here called *Epigastrium*, to which the four posterior legs are affixed, seems rather to belong to the abdomen than the trunk; with the former it is closely connected, but from the latter it is separated by a deep incisure, so that what should in strictness be called the legs (for the anterior pair having a different direction, being applied often to different uses, and inserted in a different part, I would rather denominate hands or arms), the Elytra and Epigastrium, are parts of the abdomen: yet in hymenopterous insects the incisure is between the abdomen, properly so called, and the trunk: in these the anterior legs are affixed to the under-side of the neck, and their direction is likewise towards the head.

With respect to Families, I have as yet been able to find no clue for a natural subdivision of this genus, except the following,

* Fabricius says of *Attelabus, Larva 6-poda,* this remark probably belongs to the true *Attelabi,* and so furnishes another proof that *Apion* is essentially different. Mr. Markwick (*Linn. Trans.* vi. *p.* 143. *tab.* 5. *fig. a—A.*) observed three tubercles only on each side, near the head, in the larva of one *Apion,* which supplied the place of legs. De Geer could discover none upon the larva of *Ap. Craccæ.* (*Tom.* v. *p.* 254. *tab.* vi. *fig.* 35, 36.)

lowing, which separates one or two species only from the great majority.

* *Rostro* subinflexo. *Antennis* rostro basi subtus insertis.

** *Rostro* porrecto. *Antennis* rostri latere insertis.

APION.

Synopsis Specierum.

*

1. A. *Ulicis*. Nigrum cinereo-villosulum, rostro longissimo deflexo atro, pedibus anterioribus ferrugineis.
2. A. *melanopum*. Nigricans villosulum, elytris fuscis: strigâ obliquâ baseos cinereâ, pedibus rufis: plantis atris.

**

3. A. *Malvæ*. Nigrum cinereo-villosulum, elytris antennis pedibusque testaceis.
4. A. *vernale*. Fusco-nigricans cinereo-villosulum, elytris fasciis duabus fuscis, pedibus rufis.
5. A. *Ervi*. Atrum, antennis testaceis: apice nigris, coleoptris subglobosis.
6. A. *Lathyri*. Atrum, antennis totis testaceis: clavâ distinctè articulatâ, coleoptris subglobosis.
7. A. *Ononis*. Atrum piloso-subincanum, antennis totis nigris, fronte striatulâ, thorace canaliculato, coleoptris subglobosis.
8. A. *vicinum*. Atrum subpilosum, antennis totis nigris, fronte punctatâ, thorace postice lineâ exarato, coleoptris subglobosis.
9. A. *vorax*. Atrum villoso-canescens, antennis basi testaceis, tibiis anticis *femineis* subflexuosis, coleoptris oblongis atrocæruleis.

10. A. *cæru-*

10. A. *cærulescens.* Atrum villoso-subincanum, rostro crassiusculo: apice subulato, coleoptris obovatis atro-cæruleis.
11. A. *subulatum.* Atrum subpilosum, rostro apice attenuato, coleoptris subglobosis.
12. A. *Craccæ.* Atrum villoso-subincanum, rostro crassiusculo: apice attenuato, antennis basi testaceis, coleoptris subglobosis.
13. A. *ruficorne.* Atrum villoso-incanum, rostro crassiusculo: apice subulato, antennis totis testaceis, coleoptris subglobosis.
14. A. *Viciæ.* Atrum villoso-canescens, subtus niveo-pubescens, antennis pedibusque testaceis, coleoptris globoso-ovatis.
15. A. *obscurum.* Nigrum albido-villosulum, pedibus quatuor anterioribus rufis, coleoptris globoso-oblongis obscurè nigro-æneis.
16. A. *Malvarum.* Atrum cinereo-subvillosum, subtus piloso-albicans, pedibus testaceis: plantis nigris, coleoptris ovatis nigro-æneis.
17. A. *rufirostre.* Atrum, subtus piloso-albicans, rostro dimidiato antennis pedibusque rufis, coleoptris ovatis nigro-æneis.
18. A. *nigritarse.* Atrum glabrum, rostro dimidiato pedibusque testaceis, antennis clavâ tarsisque nigris, coleoptris oblongo-ovatis.
19. A. *flavipes.* Atrum glabrum, pedibus flavis: plantis nigris, antennis basi rufis, coleoptris ovatis.
20. A. *pallipes.* Nigrum, pedibus testaceis: plantis nigris, fronte canaliculata, coleoptris oblongo-ovatis.
21. A. *Fagi.* Atrum glabrum, antennis basi femoribusque pallidis, coleoptris oblongis nigricantibus.
22. A. *assimile.* Atrum glabrum, femoribus omnibus tibiisque anticis testaceis, coleoptris subellipticis.

23. A. *fla-*

23. A. *flavifemoratum.* Atrum glabrum, femoribus omnibus tibiisque anticis testaceis, coleoptris globoso-ovatis gibbis.
24. A. *filirostre.* Atrum glabrum, coleoptris subglobosis, rostro pedibusque elongatis.
25. A. *Sorbi.* Atrum glabrum, coleoptris globosis virescenti-cæruleis, rostro *femineo* longissimo.
26. A. *subsulcatum.* Atrum glabrum, coleoptris subglobosis cæruleis, rostro mediocri, capite inter oculos ruguloso.
27. A. *foveolatum.* Atrum glabrum, coleoptris subglobosis cæruleis, rostro mediocri, fronte impressâ striatâ, thorace canaliculato.
28. A. *punctifrons.* Atrum glabrum, coleoptris subglobosis cæruleis, rostro mediocri, capite latiusculo inter oculos punctulato.
29. A. *sulcifrons.* Atrum glabrum, coleoptris subglobosis cæruleis, rostro mediocri: basi crassiori, capite inter oculos trisulco.
30. A. *striatum.* Atrum piloso-subincanum, coleoptris globosis sulcatis, thorace canaliculato.
31. A. *immune.* Atrum piloso-subincanum, coleoptris globoso-cuneiformibus sulcatis.
32. A. *virens.* Atrum, coleoptris oblongo-ovatis cæruleis viridescentibusve striatis: striâ suturali profundiori, thorace læviusculo.
33. A. *marchicum.* Atrum, coleoptris oblongo-ovatis atro-cæruleis striatis: striâ suturali profundiori, rostro breviori crassiusculo.
34. A. *ebeninum.* Aterrimum nitidum, coleoptris ovatis sulcatis, thorace lateribus subgibbosis posticè latiùs canaliculato.
35. A. *Astragali.* Æneum nitidum, coleoptris oblongo-ovatis cyaneis, thorace canaliculato.

36. A. *Spar-*

36. A. *Spartii.* Atrum glabrum, coleoptris obovatis atro-cæruleis, fronte punctatâ, rostro mediocri.

37. A. *Spencii.* Atrum piloso-obscurum, thorace canaliculato, coleoptris oblongis atro-cæruleis, fronte striatâ, rostro piloso.

38. A. *Loti.* Nigrum piloso-subincanum, coleoptris obovatis, rostro longiori.

39. A. *unicolor.* Atrum subpilosum, coleoptris oblongo-ovatis, rostro mediocri medio subincrassato.

40. A. *atomarium.* Atrum piloso-incanum, coleoptris ovatis, rostro longiori, thorace brevi.

41. A. *aterrimum.* Atrum glabrum, coleoptris subovatis nitidiusculis atro-cæruleis, rostro mediocri.

42. A. *tenue.* Aterrimum angustum sub-glabrum nitidiusculum, coleoptris oblongis, rostro mediocri.

43. A. *Seniculus.* Atrum angustum piloso-canescens, coleoptris ovato-oblongis, rostro longiori.

44. A. *confluens.* Atrum angustum piloso-subincanum, coleoptris oblongo-ovatis, fronte bisulco, antennis posticis, rostro mediocri.

45. A. *Gyllenhalii.* Atrum subangustum piloso-obscurum, coleoptris oblongiusculis, antennis piceis, rostro longiori.

46. A. *Meliloti.* Atrum subangustum, coleoptris obovatis viridescenti-cæruleis, antennis mediis, rostro longiori.

47. A. *violaceum.* Atrum glabrum, coleoptris oblongo-obovatis violaceis, rostro brevi crassiusculo.

48. A. *Hydrolapathi.* Atrum glabrum, coleoptris oblongo-obovatis cæruleis viridescentibusve, rostro brevi crassiusculo.

49. A. *Rumicis.* Atrum sub-glabrum nitidiusculum, coleoptris obovatis obtusis violaceis nigrisve, rostro mediocri.

50. A. *affine.* Atrum glabrum nitidiusculum, coleoptris obovatis obtusis viridescentibus, rostro breviori crassiusculo.

 51. A. *bre-*

51. A. *brevirostre.* Atrum obscurum subpilosum, coleoptris subovatis, rostro breviori crassiusculo.
52. A. *Hookeri.* Atrum obscuriusculum, thorace globoso.
53. A. *lævigatum.* Atrum læviusculum, coleoptris ovatis violaceis obsoletè striatis.
54. A. *Onopordi.* Atrum glabrum, coleoptris ovatis nitidè viridiæneis cærulescentibusve, thorace scabro.
55. A. *carduorum.* Atrum, coleoptris ovatis obscuris viridescentibus cæruleisve, rostro basi utrinque gibbo.
56. A. *Radiolus.* Atrum glabrum, coleoptris ovatis acutis nigroæneis, antennis posticis, rostro mediocri.
57. A. *oxurum.* Atrum, coleoptris ovatis acutis cæruleis viridescentibusve, antennis posticis, rostro mediocri.
58. A. *æneum.* Atrum glabrum, coleoptris ovatis acutis æneis viridescente-cæruleisve, fronte canaliculatâ.
59. A. *hæmatodes.* Rufum, oculis nigris, rostro brevissimo.
60. A. *frumentarium.* Sanguineum, oculis nigris, thorace subgloboso posticè canaliculato.

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1. APION ULICIS.

A. nigrum cinereo-villosulum, rostro longissimo deflexo atro, pedibus anterioribus ferrugineis. *Tab.* i. *fig.* 1.

Curculio Ulicis. *Forst. Cent.* 31. *Gmel.* 1754 165.. *Marsh. Ent. Brit.* i. 256. 54.

Long. Corp. (*Rostro excluso*) 1¼ lin.

Habitat in Angliæ *Ulice* per totum ferè annum frequentissimum. *Mus.* nostr.

DESCR.

DESCR. CORPUS nigrum, pilis decumbentibus cinereis incanum.

Caput. *Rostrum* corporis ferè longitudine, tenue, filiforme, levissimè arcuatum, atrum, nitidum. *Antennæ* breviores, posticæ*, basi rufæ. *Occiput* atrum glabrum. *Oculi* majusculi, prominentes.

Truncus subglobosus, posticè pauld latior. *Thorax* posticè (pilositate scil. abrasâ) canaliculatus, anticè submarginatus. *Pedes* anteriores ferruginei: femoribus basi nigris, posteriores quatuor nigri: tibiis obscurè rufis. *Scutellum* minutissimum. *Coleoptra* oblongiuscula, convexa, striata: striis punctatis.

Var. β. pedibus quatuor anterioribus ferrugineis.

— γ. pedibus omnibus nigris.

Obs.—*Mas* rostro vix thorace longiori.

This insect has much of the habit of Mr. Marsham's family A. b.*, yet, since the antennæ are not broken, it certainly belongs to this genus. It is remarkable that this species should not be known upon the continent, with us it is one of the most common of the tribe. It is entirely confined to *Ulex europæus*, but not, as Forster affirms, to the flowers, nor does it appear in the spring only, but may be met with all the summer, and sometimes even in the winter.

2. APION MELANOPUM.

A. nigricans villosulum, elytris fuscis: strigâ obliquâ baseos cinereâ, pedibus rufis: plantis atris.

Curculio melanopus. *Marsh. Ent. Brit.* i. 248. 27.

Attelabus fuscirostris. *Fabr. Ent. Syst. Em.* i. b. 389. 24. *Syst. Eleuth.* ii. 424. 40. Curculio fuscirostris. *Gmel.* 1743. 102.

* For my sense of these and similar terms see p. 3, 4.

Apion albovittatum. *Herbst. Natursyst.* vii. 126. 16. *t.* 103. *f.* 4.—D?

Long. Corp. 1¼ lin.

Habitat in *Spartio* inter rariora. *Mus.* nostr.

DESCR. CORPUS nigricans, cinereo-villosulum, subtùs albidius.

CAPUT. *Rostrum* brevius, subdeflexum, sæpe porrectum, filiforme, tenue, læve, nitidissimum, levissimè arcuatum, pone antennas crassius obscurius. *Antennæ* posticæ, ferè mediocres, rufæ: capitulo fuscescenti. *Oculi* magni, subprominuli.

TRUNCUS. *Thorax* posticè paulo latior et canaliculatus, nigricans: lateribus ex pilis decumbentibus albidioribus. *Pedes* rufi: femoribus basi tarsisque nigris. *Scutellum* minutissimum. *Coleoptra* oblonga, sub luce nigroænea, striata: striis punctatis, apud basin utrinque strigâ obliquâ margine que laterali piloso-albidis.

Obs.—*In quibusdam striga obliqua albida deteritur.*

3. APION MALVÆ.

A. nigrum cinereo-villosulum, elytris antennis pedibusque testaceis. *Tab.* i. *fig.* 2.

Attelabus Malvæ. *Fabr. Ent. Syst. Em.* i. b. 391. 32. *Syst. Eleuth.* ii. 426. 56.

Curculio Malvæ. *Marsh. Ent. Brit.* i. 246. 23. *Gmel.* 1743. 101. *Vill. Ent. Eur.* i. 188. 49. iv. 268. 49.

Long. Corp. 1 lin.

Habitat in Angliæ *Malvis* frequentissimum. *Mus.* nostr.

DESCR. CORPUS nigrum, pilis decumbentibus albidis incanum.

CAPUT.

CAPUT. *Rostrum* brevius, crassiusculum, villosulum, apice glabrum. *Antennæ* longiores, pone medium rostri insertæ, testaceæ, crassiusculæ: clavâ majusculâ. *Oculi* magni, subprominuli.

TRUNCUS. *Thorax* posticè paulò latior. *Pedes* testacei. *Coleoptra* oblonga, testacea, striata: striis vix punctatis. Elytrum utrumque internè apud basin obliquè nigricat.

Fabricius, and after him Mr. Marsham, have regarded *Curculio Pineti* of Paykull (*Mon. Curc.* 61. 58.) as synonymous with this insect, being led into this opinion by the error of the latter author; who, in that work, has confounded two insects essentially different. In his *Fauna Suecica*, however, (iii. 252. 72.) Paykull acknowledges his mistake. "*Minimè* Attel. Malvæ *Fabricii* (says he) *quod olim putavi, quia omnino hujus generis est.*" Herbst's *Rynchites Malvæ* is Paykull's insect, which, in the work last mentioned, that author names *Curculio Indigena*; it is found upon the Scotch fir (*Pinus Sylvestris*). *Apion Malvæ* is extremely common upon the mallow in this country, and is found upon no other plant.

4. APION VERNALE.

A. fusco-nigricans cinereo-villosulum, elytris fasciis duabus fuscis, pedibus rufis.

Herbst. Natursyst. vii. 123. 12. *t.* 102. *f.* 12.—M.

Attelabus vernalis. *Fabr. Ent. Syst. Em.* i. b. 392. 36. *Syst. Eleuth.* ii. 427. 60. *Payk. Faun. Suec.* iii. 183. 18.

Curculio vernalis. *Payk. Mon. Curc.* 138. 129.

Curculio concinnus. *Marsh. Ent. Brit.* i. 248. 26.

Curculio urticarius. *Herbst. Arch.* 74. 30.

Curculio Lythri. *Panz. Faun. Germ. Init.* 17. *t.* 8.

Long.

Long. Corp. 1. lin.

Habitat tempore vernali in *Ballota*, *Lamio* et *Urticis* haud rarum. *Mus.* nostr.

DESCR. CORPUS angustum satis, fusco-nigricans, albido-pilosum.

Caput cinereo-pilosulum. *Rostrum* mediocre, filiforme, leviter arcuatum, glabrum, nitidum, pone antennas incrassatum. *Antennæ* mediocres, posticæ, testaceæ. *Oculi* prominuli, pilis densis albidis undique cincti.

Truncus. *Thorax* piloso-cinerascens: lateribus albidioribus, posticè paulò latior et canaliculatus. *Pedes* testacei: tarsis articulo unguiculari nigro. *Coleoptra* ovato-oblonga, striata: striis subpunctatis, ex pilis decumbentibus cinerea: fasciis duabus obliquis, undulatis, fuscis, glabris, primâ ad medium, secundâ pone medium parvo intervallo.

Mas minor, rostro breviori pilositate cincreâ tecto.

Obs.—*Elytrorum pubes cinerea interdum abraditur, et tunc fusca seu fusco-picea evadunt.*

I received this very minute insect amongst the Swedish *Coleoptera* sent me by Major Gyllenhal, for *Attelabus vernalis* of Fabricius, and upon comparing it with that author's description no doubt can remain of its being the same. It is common in England in the spring, feeding principally upon black ballote (*Ballota nigra*), sometimes it is found on white dead-nettle (*Lamium album*), and often upon the common stinging nettle (*Urtica dioica*), a circumstance which seems to indicate that the latter plant possesses some further affinity with the former than the mere shape of the leaves*.

5. APION

* I mention this fact that it may not be lost, without wishing to build any hypothesis

5. APION ERVI.

A. atrum, antennis testaceis: apice nigris, coleoptris subglobosis.

Attelabus Ervi. *Mus. Dom. Gyllenhal.*

Long. Corp. $1\frac{1}{3}$ lin.

Habitat in Angliâ, Sueciâ. In vico dicto Brent-Illeigh prope Lavenham in Suffolciâ, Jul. 14, 1804 (et iterum apud Barham, Jul. exeunt. 1805), in *Lathyro pratensi* legi. *Mus.* nostr.

DESCR. CORPUS atrum, pilis albicantibus, nisi sub lente vix conspicuis, respersum.

Caput inter oculos striatulum. *Rostrum* longius, ante antennas nitidum, basi obscuriusculum. *Antennæ* sublongiores, pone medium rostri insertæ, testaceæ: clavâ nigrâ. *Oculi* subprominuli.

Truncus subcylindricus. *Thorax* posticè lineolâ impressâ. *Tibiæ* tenues admodum. *Scutellum* minutissimum. *Coleoptra* ex obovato subglobosa, subsulcata: sulculis punctatis.

Obs.—*In altero sexu rostri apex paulò dilatatus. Thorax per totam ferè longitudinem canaliculatus.*

I originally received this insect from Major Gyllenhal, under the name of *Attelabus Ervi.* I have since taken it both at Barham and elsewhere upon *Lathyrus pratensis.*

The Swedish specimens are móre hairy than our English ones.

sis upon it. It is further remarkable, that *Curculio Scrophulariæ* and *bipustulatus*, (*Marsh. Ent. Brit. n.* 117. 121.) both of which feed upon water betony (*Scrophularia aquatica*), attack, in great numbers every year, *Buddleia occidentalis* in my garden. It is observable that these plants, though of different classes and orders, are all tetrandrous.

6. APION

6. APION LATHYRI.

A. atrum, antennis totis testaceis: clavâ distinctè articulatâ, coleoptris subglobosis.

Long. Corp. $1\frac{1}{3}$ lin.

Habitat in Angliâ cum præcedente. *Mus.* nostr.

DESCR. CORPUS atrum, ex pilositate albidâ haud densâ leviter incanum.

Caput inter oculos bistriatum. *Rostrum* brevius, pilosulum, apice nitidum. *Antennæ* longiores, mediæ, totæ pallidè testaceæ: clavâ tenui admodum; articulis subdistinctis. *Oculi* subprominuli.

Truncus dorso longitudinaliter canaliculatus. *Scutellum* minutissimum. *Coleoptra* ex obovato subglobosa, subsulcata: sulculis punctatis.

Obs.—*Maris* rostrum vix pilosum. Antennæ clavâ majusculâ: articulis arctè connexis. Thorax posticè puncto impresso, nec canaliculatus.

This species so nearly resembles the preceding, that it is not without considerable hesitation I give them as distinct: since, however, I possess the sexes of each, and the males differ in the shape of the rostrum, and the females both in the proportion of the clava of the antennæ and the connection of its joints, these circumstances will, I think, warrant my separating them. That they feed upon the same plant, though a presumptive, is by no means a demonstrative, evidence of their identity, since it often happens that the same plant furnishes food to several species in this genus. Major Gyllenhal, however, sent this amongst specimens of *Ap. Ervi*, considering it, I suppose, as merely a variety.

7. APION

7. APION ONONIS.

A. atrum piloso-subincanum, antennis totis nigris, fronte striatulâ, thorace canaliculato, coleoptris subglobosis.

Long. Corp. $1\frac{1}{4}$ lin.

Habitat in Angliæ *Onone.* Julio mense 1806 frequens. *Mus.* D. Spence. Nostr.

DESCR. CORPUS atrum, ex pilositate subincanum, obscuriusculum.

CAPUT longum satis, inter oculos striatulum. *Rostrum* sublongius, filiforme. *Antennæ* mediæ, sublongiores, totæ nigræ. *Oculi* subprominuli.

TRUNCUS ferè cylindricus, angustus, dorso canaliculatus. *Scutellum* minutissimum. *Coleoptra* ex oblongo globosa, sulcato-striata: striis punctatis; interstitiis planiusculis.

Obs.—*Maris rostrum brevius, paulò crassius, magìs pilosum.*

This species resembles the two preceding in almost every respect, except the colour of its antennæ, which are entirely black. Since, however, it inhabits a different plant (It is never found upon *Lathyrus pratensis*, nor, vice versâ, *Ap. Ervi* and *Lathyri* upon *Ononis*), I think I am justified in giving it as a distinct species.

8. APION VICINUM.

A. atrum subpilosum, antennis totis nigris, fronte punctatâ, thorace posticè lineâ exarato, coleoptris subglobosis. *Tab.* i. *fig.* 3.

Apion Loti. *Mus.* Dom. Gyllenhal.

Long. Corp. $1\frac{1}{4}$ lin.

Habitat. In Sueciæ *Loto* (*corniculato?*) D. Gyllenhal. In Angliâ semel a Dom. Spence lectum. *Mus.* D. Spence. Nostr.

DESCR. CORPUS atrum, subpilosum, obscuriusculum.

CAPUT

Caput breve admodum, inter oculos punctatum. *Rostrum* longius, filiforme, satis arcuatum, basi pauló incrassatum. *Antennæ* posticæ. *Oculi* prominuli.

Truncus brevis, ex globoso teretiusculus, posticè lineolâ dorsali brevissimâ et nisi sub lente forti vix conspicuâ leviter exaratus. *Scutellum* minutissimum. *Coleoptra* ex oblongo globosa, sulcato-striata: striis punctatis; interstitiis planiusculis.

This insect much resembles *Ap. Ononis,* but seems sufficiently distinguished from it by having a shorter and wider head, puncta instead of striæ between the eyes, instead of a longitudinal channel a very short faintly impressed line upon the thorax just above the scutellum, a rostrum more arched, and a less hairy body. It comes nearer to *Apion Loti* (n. 38), but it is a shorter insect, with a shorter rostrum, a wider head, elytra taken together of a different shape, and interstices of the striæ flat.

9. APION VORAX.

A. atrum villoso-canescens, antennis basi testaceis, tibiis anticis *femineis* subflexuosis, coleoptris oblongis atro-cæruleis.

Herbst. Natursyst. vii. 129. 20. *t.* 103. *f.* 8—H.

♀

Curculio villosulus. *Marsh. Ent. Brit.* i. 250. 34.

♂

Curculio fuscicornis. *Marsh. Ent. Brit.* i. 244. 17.

Long. Corp. ♀ 1¾ lin. ♂ 1¼ lin.

Habitat in Sueciâ. In Angliæ *Fraxino sæpiùs* legi. *Mus.* D. Marsham. Nostr.

DESCR. CORPUS atrum, totum pilis albidis decumbentibus incanum.

Caput

Caput elongatiusculum, inter oculos bistriatum. *Rostrum* longius, ante antennas nitidum, basi obscuriusculum. *Antennæ* mediocres, mediæ, basi testaceæ. *Oculi* sub-immersi, magni.

Truncus. *Thorax* leviter punctulatus, posticè lineolâ exaratus. *Scutellum* minutum. *Coleoptra* oblonga, atro-cærulea, subsulcata: sulculis punctatis.

Obs.—*Feminæ rostrum mediocre. Antennæ pone apicem rostri insertæ capitulo tenui. Tibiæ anteriores basi et medio subattenuatæ undè subflexuosæ evadunt.*

What I have given as the two sexes of this insect (which is evidently *Apion vorax* of Herbst, and which has been sent to me as such from Sweden) stand in Mr. Marsham's cabinet as his *Curculio fuscicornis* and *villosulus*; and once, led by the shape of the anterior tibiæ in that which I take to be the female, I regarded them as distinct myself; but upon reconsidering the subject, I find that they agree together so exactly in every circumstance, except such as are common sexual characters in this genus, that I have scarcely any doubt of their identity.

10. APION CÆRULESCENS.

A. atrum villoso-subincanum, rostro crassiusculo: apice subulato, coleoptris obovatis atro-cæruleis. *Tab.* i. *fig.* 4.

Curculio cærulescens. *Marsh. Ent. Brit.* i. 245. 20.

Attelabus Pomonæ. *Fabr. Suppl.* 164. 27—8. *Syst. Eleuth.* ii. 425. 48.

Var. β.

Curculio glaber. *Marsh. Ent. Brit.* i. 245. 19.

Long. Corp. ♂ 1¾ lin. ♀ 2¼ lin.

Habitat in Angliæ *Oxyacanthâ.* "In Kiliæ *Pomona.*" Fabr. *Mus.* nostr.

DESCR. CORPUS atrum, totum pilis albidis subincanum.

CAPUT punctulatum, inter oculos rugulosum. *Rostrum* brevius, crassum, pilosum, punctatum, apice subulatum deflexum, subtus medio dilatatum et quasi incisum, antennis ex incisuræ fossulâ provenientibus*. *Antennæ* mediocres, posticæ, *Oculi* prominuli.

TRUNCUS ex nigro paululùm cærulescens, posticè latior, apice submarginatus margine parum reflexo, ante scutellum lineolâ exaratus, punctatus pilo, quod sæpiùs fit in hoc genere, ex singulis punctis prodeunte. *Scutellum* minutum. *Coleoptra* obovata, cærulescentia, sulcato-striata: striis punctatis; interstitiis planis.

Mas feminæ simillimus, sed rostri apex glaber, nitidus, magìs et subitò attenuatus†. Frons inter oculos sulculis duobus. Antennæ articulo primo basi obscurè rufo.

Var. β. Adultior glaber, elytris vix colore cæruleo infectis.

Mr. Marsham's *Curc. cærulescens* is clearly synonymous with *Attel. Pomonæ* of the Supplement of Fabricius. The latter author quotes Herbst's *Apion ruficorne* as a variety of his insect, but in this I think him mistaken; that insect, which I shall shortly describe, being quite distinct, and more nearly related to *Apion Craccæ*. *Curculio glaber* was admitted into Mr. Marsham's useful work upon my authority: I am now convinced that it is merely a variety of the male of *Apion cærulescens* (which I had not then seen) that has lost its pubescence and colour through age.

11. APION SUBULATUM.

A. atrum subpilosum, rostro apice attenuato, coleoptris subglobosis. *Tab.* i. *fig.* 5.

Long. Corp. $1\frac{1}{3}$ lin.

* *Tab.* i. *fig.* 4, a. † *Ibid.* b.

Habitat

Habitat in Angliæ *Lathyro pratensi.* Mense Julio 1805 tria cepi. *Mus.* nostr.

DESCR. CORPUS atrum, opacum, pilositate parvâ, nisi sub lente vix conspicuâ, respersum.

Caput punctulatum, inter oculos striatulum. *Rostrum* mediocre, basi incrassatum obscurum, apice attenuatum nitidum, subtus vix dilatatum*. *Antennæ* mediocres, pone medium rostro insidentes: articulo primo basi obscurè rufo; clavâ majusculâ. *Oculi* subprominuli.

Truncus lineâ dorsali anticè abbreviatâ exaratus. *Scutellum* minutissimum. *Coleoptra* ex obovato subglobosa, striata: striis punctatis; interstitiis planis.

Var. β. Rostro acumine breviori, basi crassiori. An Sex. alt.?

This species a good deal resembles variety β of that last described; but it is smaller, the rostrum is not dilated underneath, its acumen is longer, and the elytra are shorter in proportion.

12. APION CRACCÆ.

A. atrum villoso-subincanum, rostro crassiusculo: apice attenuato, antennis basi testaceis, coleoptris subglobosis.

Herbst. Natursyst. vii. 102. 2. *t.* 102. *fig.* 2—B.

Curculio Craccæ. *Linn. Syst. Nat. Ed.* 12. 606. 6. *Gmel.* 1743. 6.

Marsh. Ent. Brit. i. 245. 18. *Vill. Ent. Eur.* i. 174. 3. *Payk. Mon. Curc.* 131.

Curculio Viciæ. *De Geer.* v. 253. 43. *t.* 6. *f.* 31, 32.

Attelabus Craccæ. *Payk. Faun. Suec.* iii. 177. 11. *Walck. Faun. Paris.* i. 236. 11.

* *Tab.* i. *fig.* 5. a.

Long.

Long. Corp. 1¼ lin.

Habitat in Europæ septentrionalis *Viciæ Craccæ* seminibus et floribus. *Mus.* Linn. Nostr.

DESCR. CORPUS atrum, obscurum, ex pube albidâ leviter incanum.

Caput punctulatum, inter oculos rugulosum. *Rostrum* brevius, compressum, basi valde incrassatum rugulosum depressum, apice attenuato-subulatum læve, nitidum, subtùs carinatum, ab apice basin versus sensim dilatatum et quasi sacculiforme; dein incisum*. *Antennæ* longiores, posticæ, basi testaceæ: clavâ nitidâ, in fossulâ rostri insertæ. *Oculi* prominuli, magni.

Truncus ex globoso teretiusculus, leviter punctulatus, dorso lineâ longitudinali utrinque abbreviatâ exaratus, anticè submarginatus. *Scutellum* minutissimum. *Coleoptra* subglobosa, sulcato-striata: striis punctatis; interstitiis planiusculis.

Amongst the synonyms of *Apion Craccæ* I have not referred to Fabricius, because he appears to have mistaken a different insect for it. *Elytra obscurè cærulea* and *Rostrum apice depressum* are terms which will not at all agree with the true *Apion Craccæ*, the original specimen of which still remains in the Linnean Cabinet. Panzer, likewise, has figured an insect under this name which has no relation to ours, for it differs from it both in size, (being considerably larger,) shape, and colour, and it wants the subulate rostrum, the most prominent feature of this species†.

13. APION RUFICORNE.

A. atrum villoso-incanum, rostro crassiusculo: apice subulato, antennis totis testaceis, coleoptris subglobosis.

* *Tab.* i. *fig.* 4. c. † *Faun. Germ. Init.* 20. *t.* 10.

Herbst.

Herbst. Natursyst. vii. 110. 8. *t.* 102. *f.* 8—H.

Long. Corp. $1\frac{1}{3}$ lin.

Habitat in Angliâ, Borussiâ rarissimè. In *Corylo* legi Jun. ex 1805. *Mus.* D. Hooker. Nostr.

DESCR. CORPUS atrum, obscurum, piloso-incanum.

Caput pube albâ densiùs obsitum: lineâ intermediâ glabrâ. *Rostrum* brevius, totum ex pilis decumbentibus niveum, basi incrassatum, apice subulatum acumine breviusculo, subtùs ferè ut in specie præcedenti. *Antennæ* longiores, mediæ, tenues admodum, totæ testaceæ. *Oculi* prominuli, magni.

Truncus minutissimè punctulatus, lineâ dorsali anticè abbreviatâ obsoletiùs exaratus. *Scutellum* minutissimum. *Coleoptra* subglobosa, sulcato-striata: striis punctatis; interstitiis planiusculis.

This little insect, although very nearly related to *Apion Craccæ*, is, I think, distinct from it: the hair on the body is thicker; the rostrum has a shorter acumen, and is covered, from the base to the tip, with white hairs; the antennæ, likewise, are entirely testaceous. Fabricius regarded it, as I observed before, merely as a variety of his *Attelabus Pomonæ*, but from that insect it differs not only in the colour of its elytra, but also in their shape, being proportionally shorter, so that, when taken together, they are subglobose. Herbst never saw but one specimen of it; and three only, that I know of, have been taken in England, one by Mr. W. J. Hooker, of Norwich, a most ingenious and indefatigable entomologist, and two others by myself.

14. APION VICIÆ.

A. atrum villoso-canescens, subtùs niveo-pubescens, antennis pedibusque testaceis, coleoptris ovatis.

Attelabus

Attelabus Viciæ. *Payk. Faun. Suec.* iii. 181. 16.

Apion difficile. *Herbst. Natursyst.* vii. 124. 13. *t.* 103. *f.* 1—A?

Long. Corp. 1¼ lin.

Habitat in Angliæ et Sueciæ *Viciâ Craccâ. Mus.* D. Gyllenhal, Nostr.

DESCR. CORPUS atrum, supra pilis albis subincanum, subtus ex pube densâ niveum.

Caput inter oculos striatulum. *Rostrum* brevius, ex pilositate niveum, summo apice glabro nitido. *Antennæ* longiores, mediæ, totæ flavo-testaceæ. *Oculi* subprominuli.

Truncus brevis admodum, ex globoso teretiusculus, leviter punctulatus, lineolâ dorsali posticè impressus. *Pedes* flavo-testacei: tibiis quatuor posterioribus tarsisque omnibus nigricante-rufis. *Scutellum* minutum, apice rotundatum. *Coleoptra* ex globoso ovata, sulcato-striata: striis punctatis; interstitiis planiusculis.

Obs.—*Alter sexus rostro mediocri tenuiori, basi subincrassato obscuro, ante antennas glabro nitido. Antennis pone medium rostri insertis.*

This insect was described by Paykull from specimens furnished by my learned correspondent Major Gyllenhal, who likewise sent it to me. He met with it upon *Vicia Cracca*; I have since found it very plentiful upon the same plant. I once thought that this might be the true *Curc. Trifolii* of Linné, but the characters *Rostrum thorace longius* and *Thorax excavato-punctatus* will not at all suit our insect. I have referred to *Apion difficile* of Herbst with a mark of interrogation, because he makes no mention of the white down which covers the underside of the body, a circumstance not likely to be omitted by so minute a describer, yet his insect in other respects is certainly nearly related to ours.

15. APION

15. APION OBSCURUM.

A. nigrum albido-villosulum, pedibus quatuor anterioribus rufis, coleoptris globoso-oblongis obscurè nigro-æneis.

Curculio obscurus. *Marsh. Ent. Brit.* i. 244. 16.

Long. Corp. 1¼ lin.

Habitat in Anglia rarissimè, a D. Lambert lectum. *Mus.* D. Marsham. Nostr.

DESCR. CORPUS nigrum, pilis albidis subcinereum.

Caput inter oculos excavato-punctatum: punctis confluentibus. *Rostrum* longius, pone antennas crassius. *Antennæ* pone medium rostri insertæ, nigræ: articulo primo obscurè rufo.

Truncus punctatus: punctis valde excavatis confluentibus, lineâ dorsali intermediâ posticè exaratus. *Pedes* quatuor anteriores rufi: genubus nigris. *Scutellum* minutum, medio excavatum. *Coleoptra* ex globoso oblonga, obscurè nigro-ænea, striata: striis subpunctatis; interstitiis planis.

This is the largest species of this minute genus that I have yet seen; it has been noticed by no author besides my ingenious friend Mr. Marsham in his excellent *Entomologia Britannica.* Two specimens were found amongst a parcel of insects given him by Aylmer Bourke Lambert, Esq., and these are the only ones that have yet been seen.

16. APION MALVARUM.

A. atrum cinereo-subvillosum, subtùs piloso-albicans, pedibus testaceis: plantis nigris, coleoptris ovatis nigro-æneis.

Curculio Trifolii. *Marsh. Ent. Brit.* i. 246. 22.

Long. Corp. 1⅓ lin.

Habitat in Angliæ *Malvis* frequens. *Mus.* nostr.

DESCR. CORPUS atrum, pilositate subcinereâ levissimè incanum, subtùs, præcipuè ad latera, pilis densioribus lacteum.

Caput leviter punctulatum. *Rostrum* longius, nitidum, basi paulò crassius. *Antennæ* breviores, posticæ, totæ nigræ vel piceo-nigræ. *Oculi* parum prominuli, ex parte inferiori cilio longiusculo albido cincti.

Truncus ex globoso teretiusculus, leviter punctulatus, lineolâ dorsali brevissimâ posticè obsoletiùs exaratus. *Pedes* testacei: tarsis nigris. *Scutellum* minutissimum. *Coleoptra* ovata, nitidiuscula, nigro-ænea, striata: striis subpunctatis; interstitiis planiusculis.

This insect stands in Mr. Marsham's cabinet as *Curculio Trifolii* of Linné, and it certainly agrees with the description of the illustrious Swede better than any other of these yellow-legged Apions; so that my ingenious friend's error, since he did not know the true *habitat* of the insect in question, furnishes, in effect, a proof his accuracy, especially when it is considered that he had been informed by Mr. Markwick of the devastation committed upon *Trifolium pratense* by a species, which from the description of that gentleman seemed synonymous with it. I say error, because I think this species is not *C. Trifolii* of Linné, and clearly distinct from that to which Mr. Markwick so justly attributes the damage often occasioned to crops of clover-seed. Linné informs us that his insect feeds upon *Trifolium montanum*, whereas *Apion Malvarum* is confined to the mallow, and is never to be met with upon any diadelphous plant: the former, except the abdomen and thighs, appears to be all black, but the elytra of the latter are nigro-æneous: in that the thighs only are described as of a pale colour (*pallida*); in this the whole leg, except the tarsus, is testaceous. Yet had this insect fed upon *Trifolium*, and been synonymous with Mr. Markwick's,

these

these differences might have been regarded as accidental; and, since Linné does not always use his terms rigidly according to their strict definition, and in his descriptions often omits to notice many peculiarities of the subject he is treating of, it might have been thought that in the present instance latitude of this kind was taken: but our insect is quite distinct from the clover Weevil; the shape of the thorax and that of the elytra taken together is different, the former being more spherical, and the latter more oblong. The *Apion* of the mallow is also hairy, especially underneath, which gives the whiteness to its breast and abdomen, whereas Mr. Markwick's insect has no hairs upon it, and is quite black underneath. That gentleman, indeed, in his description, speaks of his specimens as having "a whitish belly," (a circumstance which naturally induced Mr. Marsham to regard the two insects as synonymous) but in a letter with which he favoured me, in answer to some queries I put to him upon this subject, he says, "I well remember that when this insect was first excluded from its chrysalis state, its belly was whitish, as I have described it, but I think I afterwards discovered that its belly soon (in a day or two) changed to black, which may account for the difference in Mr. Lehmann's description and mine."

17. APION RUFIROSTRE.

A. atrum, subtùs piloso-albicans, rostro dimidiato antennis pedibusque rufis, coleoptris ovatis nigro-æneis.

Herbst. Natursyst. vii. 111. 10. *t.* 102. *f.* 10—K.

Curculio rufirostris. *Fab. Syst. Ent.* 132. 25. *Sp. Ins.* i. 167. 35. *Mant.* i. 100. 46. *Marsh. Ent. Brit.* i. 246. 21. *Gmel.* 1744. 107. *Vill. Ent. Eur.* i. 187. 44. iv. 267. *Ross. Faun. Etrusc.* i. 122. 293. *Hellw.* 293.

 Attelabus

Attelabus rufirostris. *Fabr. Ent. Syst. Em.* i. b. 390. 26. *Syst. Eleuth.* ii. 424. 43.

Long. Corp. $1\frac{1}{4}$ lin.

Habitat in Angliæ *Malvis* cum præcedente. *Mus.* nostr.

DESCR. CORPUS atrum, obscurum, suprà albido subpilosum, subtùs totum pilis densis lacteum.

Caput inter oculos rugulosum. *Rostrum* brevius, crassiusculum, basi nigrum, ante antennas rufum, apice summo iterum nigro. *Antennæ* mediocres, testaceæ, posticæ: clavâ crassiusculâ. *Oculi* vix prominuli.

Truncus ex globoso teretiusculus, leviter punctulatus, lineolâ posticâ brevissimâ suprà obsoletiùs exaratus. *Pedes* testacei: tarsis articulis duobus extimis nigris. *Scutellum* minutum. *Coleoptra* ovata, nigro-ænea, striata: striis vix punctatis; interstitiis planiusculis.

Abdomen. *Anus* testaceus.

This insect certainly bears, in many respects, considerable resemblance to *Apion Malvarum*; yet it differs so materially in others, that I cannot help regarding them as distinct: its rostrum rufous at the end, its rufous anus and antennæ are differences too striking to be regarded as merely indications of sex, unless stronger evidence could be adduced than the mere circumstance of their inhabiting the same plant. I have therefore, notwithstanding an observation of Hellwig's recorded by Herbst which intimates that they are varieties, ventured to continue them as distinct.

18. APION NIGRITARSE.

A. atrum glabrum, rostro dimidiato pedibusque testaceis, antennis clavâ tarsisque nigris, coleoptris oblongo-ovatis. *Tab.* 1. *fig.* 6.

Long. Corp. $\frac{3}{4}$ lin.

Habitat

Habitat in Angliæ *Corylo*, apud Nacton prope Gippovicum a nobis et Dom. Sheppard bis lectum, iterum a Dom. Spence in Comitatu Eboracensi. *Mus.* Dom. Sheppard, Spence, nostr.

DESCR. CORPUS totum aterrimum, et, capite excepto, glabrum.

Caput inter oculos punctulatum, pilis albicantibus subincanum. *Rostrum* mediocre, ante antennas pallidè testaceum. *Antennæ* longiores, mediæ, pallidè testaceæ: clavâ nigrâ. *Oculi* prominuli.

Truncus minutissimè punctulatus, dorso canaliculatus. *Pedes* pallidè testacei: tarsis nigris. *Coleoptra* ex oblongo-ovata, striata: striis punctatis.

Obs.—*Caput interdum nudum. Thorax vix canaliculatus.*

My valuable friend, the Rev. Revett Sheppard, first found this insect. I afterwards took a specimen upon the hazle-nut, and Mr. Spence met with it upon the same shrub in Yorkshire.

It is considerably smaller than *Apion rufirostre:* the body is without hairs; the knob of the antennæ, the tarsi, and the elytra, are black; in other respects it much resembles that species.

19. APION FLAVIPES.

A. atrum glabrum, pedibus flavis: plantis nigris, antennis basi rufis, coleoptris ovatis.

Herbst. Natursyst. vii. 106. 5. *t.* 102. *f.* 5—E.

Curculio flavipes. *Fabr. Syst. Ent.* 133. 13. *Sp. Ins.* i. 169. 47. *Mant.* i. 102. 63. *Gmel.* 1745. 11. *Payk. Mon. Curc.* 144. 135.

Attelabus flavipes. *Fabr. Ent. Syst. Em.* i. b. 391. 33. *Syst. Eleuth.* ii. 427. 57. *Payk. Faun. Suec.* iii. 182. 17. *Walck. Faun. Paris.* i. 236. 13.

Long. Corp. 1¼ lin.

Habitat Larva in Angliæ *Trifolii repentis* capitulis, *Imago* in sepibus per totam æstatem obvia, et in tempore inflorescentiæ

in

in plantâ supradictâ frequens uterque sexus. *Mus.* nostr. Var. β. *Mus.* Dom. Marsham.

DESCR. CORPUS atrum, subnitidum, glabriusculum.

Caput paulò longius quàm in hoc genere mos est, punctulatum, inter oculos striatulum. *Rostrum* brevius nitidum, basi et apice paulò crassius. *Antennæ* longiores, pone medium rostri insertæ, basi testaceæ. *Oculi* subprominuli.

Truncus angustus, subcylindricus, punctulatissimus, posticè lineâ dorsali leviter exaratus. *Pedes* flavi: apophysibus tarsisque nigris. *Scutellum* minutissimum. *Coleoptra* globoso-ovata, striata: striis punctatis; interstitiis planiusculis.

Var. β. Tibiis omnibus piceis.

Obs.—*In altero sexu rostrum mediocre, Coleoptra oblongo-ovata.*

This insect, which I received from Sweden as *Attelabus flavipes* of Fabricius, is not uncommon in this country: it may frequently be met with, early in the spring, in hedge-rows and warm situations, but it deposits its eggs in the heads of white or Dutch clover (*Trifolium repens*), in which the sexes may commonly be found. I took it last summer (1805) in great numbers upon this plant in Suffolk, and afterwards in Middlesex; and Mr. Markwick, near Tunbridge. The insect which does so much damage to common clover is a distinct species from this, and it is remarkable, that so far as my observation has extended, these two species confine themselves each to its own kind of clover, without interfering the one with the other.

20. APION PALLIPES.

A. nigrum, pedibus testaceis: plantis nigris, fronte canaliculatâ, coleoptris oblongo-ovatis. *Tab.* 1. *fig.* 7.

Apion

Apion pallipes. *Mus.* D. Gyllenhal.

Long. Corp. $1\frac{1}{4}$ lin.

Habitat in Angliæ sepibus rariùs. Etiam in Sueciâ. *Mus.* nostr.

DESCR. CORPUS nigrum, obscuriusculum, pilosulum.

Caput latum, punctulatum, inter oculos canaliculatum. *Rostrum* submediocre, glabrum, nitidum, apice pauló dilatatum. *Antennæ* longiores, posticæ, basi obscurè rufæ. *Oculi* prominuli.

Truncus ex globoso teretiusculus, punctulatissimus, lineolâ posticâ dorsali obsoletiusculâ. *Pedes* testacei: tarsis nigris. *Scutellum* minutum. *Coleoptra* oblongo-ovata striata: striis punctatis; interstitiis planiusculis.

Var. β. Rostro breviori, punctulato. *An sex. alt.?*

Unless it be very closely examined, this insect is very liable to be confounded with *Apion flavipes*, yet it exhibits some very discriminating characters, which in a larger insect would at first sight establish its claim to be considered as a distinct species. The head is much wider in proportion; a single channel or furrow, drawn longitudinally, distinguishes the space between the eyes; the rostrum is thicker and a little wider at the apex; and, to name no other circumstance, the thorax is not nearly so narrow, and of a different shape. Since I have both sexes of *Apion flavipes*, I can see that these are not sexual characters; and from the rostrum being shorter in variety β of *Apion pallipes* (a usual sexual distinction) I may presume that I possess the sexes of the latter insect, in which case no doubt can remain of their being distinct. In the Swedish specimens of this insect, the channel between the eyes is not so visible as it is in the English ones.

21. APION

21. APION FAGI.

A. atrum glabrum, antennis basi femoribusque pallidis, coleoptris oblongis nigricantibus. *Tab.* 1. *fig.* 8.

Curculio Fagi. *Linn. Syst. Nat. Ed.* 12. 611. 44. *Faun. Suec.* 609. *It. Scan.* 111. *Gmel.* 1761. 44.

Long. Corp. 1½ lin.

Habitat in Sueciæ *Fagi* foliis. Linn. *Mus.* Linn. nostr.

DESCR. CORPUS atrum, glaberrimum.

Caput punctulatum. *Rostrum* longius, pone antennas paulò crassius et punctulatum. *Antennæ* longiores, mediæ, basi pallidæ. *Oculi* majusculi, parum prominuli.

Truncus subcylindricus, punctulatissimus. *Thorax* posticè obsoletiùs canaliculatus. *Pedes* nigri: femoribus luteo-pallidis. *Scutellum* minutissimum. *Coleoptra* oblongiuscula, nigro-picea cum levi tincturâ violæ, sulcato-striata: striis punctatis; interstitiis planiusculis.

Var. β. Tibiis anticis etiam pallidis.

This is one, amongst many, of the original Linnean insects, which appears not to be known by the entomologists of the present day. Paykull candidly owns (*Faun. Suec.* iii. 268. 90.) *Olim in Mon. Curc. sub nomine* Curc. Fagi *a me determinatus,* (*viz.* Curc. Populi *Fabr.*) *sed descriptio Linnæana* Curc. Fagi *non quadrat, mihi igitur ille adhuc ignotus est.*

I should conjecture, from Fabricius's altering the terms of Linné's description, that he had seen an insect which he took for *Curc. Fagi,* but since the true one would be an *Attelabus* according to his system, and he has kept his in *Curculio,* (*Rhynchænus Syst. Eleuth.*) and amongst the *saltatorii,*—hence, I imagine, that

that as yet he is unacquainted with it; and on this account I have not referred to him.

It will be expected that I assign my reasons for giving the insect here described as the genuine *Curculio Fagi* of Linné. My description was taken from the original specimens still preserved in the Linnean Cabinet. These are fastened with gum upon a piece of paper inscribed by Linné's own hand, which places their identity beyond all question; since the name, being written upon the same paper on which the insects are fastened, cannot have been changed even by accident.

That naturalists should have been at a loss about this species appears not so wonderful, when we consider that Linné has placed it in an order to which it does not belong, namely amongst his *Saltatorii, femoribus posticis crassis.* There is one circumstance mentioned in the description of *Faun. Suec.*, which, if it had been observed, would have pointed out that this insect was in a wrong place—viz. *Antennæ—infimo articulo—vix reliquis longiore.* In the curculios of that family, and indeed in all the genuine curculios, the first joint of the antennæ is nearly as long as all the rest taken together, and forms an angle with them. Whether this insect be a jumper, having never seen a living specimen, I cannot positively say; yet none of the species of the genus *Apion*, that are known at present, are of that description; and the posterior thighs of *Apion Fagi* are scarcely thicker than the four anterior, and therefore are not particularly adapted to such a mode of motion.

Scopoli has a *Curculio Fagi,* and Linné refers to him for it, hastily it should seem, and without sufficiently attending to his description. *Totus niger, villo brevi pubescens. Caput gerit rostro nihilo brevius—neque dicendus longirostris.* These are characters which are quite at variance with the genuine insect and his own description.

22. APION ASSIMILE.

A. atrum glabrum, femoribus omnibus tibiisque anticis testaceis, coleoptris subellipticis.

Long. Corp. 1¼ lin.

Habitat in Angliæ *Trifolii ochroleuci* capitulis et foliis. *Mus.* nostr.

DESCR. CORPUS atrum, glabrum, obscuriusculum, tenue admodum.

CAPUT inter oculos striatulum. *Rostrum* mediocre, punctulatum, apice nitidum, pone antennas crassius. *Antennæ* longiores, mediæ, basi piceæ. *Oculi* subimmersi.

TRUNCUS subcylindricus, angustus, punctulatissimus: punctis confluentibus, dorso posticè subcanaliculatus. *Pedes* atri; femoribus omnibus, apophysibus tibiisque anticis, his obscurè, rufo-testaceis. *Scutellum* minutissimum. *Coleoptra* aterrima, subelliptica, leviter striata: striis obsoletiùs punctatis; interstitiis planiusculis.

Obs.—*Alter sexus rostro longiori, thorace posticè magis conspicuè canaliculato.*

23. APION FLAVIFEMORATUM.

A. atrum glabrum, femoribus omnibus tibiisque anticis testaceis, coleoptris globoso-ovatis gibbis.

Herbst. Natursyst. vii. 125. 14. *t.* 103. *f.* 2—B.

Curculio Trifolii var. *Marsh. Ent. Brit.* i. 246. 22. *Trans. Linn. Soc.* vi. 142. *t.* 5. *f.* a—d.

Curculio ochropus. *Müll. Zool. Dan. Prod.* 9. 1018. *Act. Nidros.* 4—15. *Gmel.* 1757. 203.

Attelabus flavipes. *Panz. Ent. Germ.* 298. 22. *Faun. Germ. Init.* 20. *t.* 13.?

Le Becmare noir à pattes fauves. *Geoffr.* i. 272. 8.

Long. Corp. 1¼—1¾ lin.

Habitat

Habitat in Angliæ *Trifolii pratensis* satis, *Larva* semina exedens, *Imago* ubique frequentissima per totum ferè annum.

DESCR. CORPUS atrum, glabrum.

CAPUT punctulatum, inter oculos rugulosum. *Rostrum* longius, filiforme, nitidum, punctulatum, medio paulò crassius. *Antennæ* mediocres, mediæ, basi testaceæ. *Oculi* subimmersi.

TRUNCUS punctulatus, posticè lineolâ dorsali exaratus. *Pedes* atri: femoribus omnibus, apophysibus tibiisque anticis, at hi obscuriùs, rufo-testaceis. *Scutellum* minutissimum. *Coleoptra* subglobosa seu ex globoso ovata, fornicata et ferè gibba, nitidiuscula, nigra, nigrore sæpiùs æneo leviter infecto, striata: striis punctatis; interstitiis convexiusculis.

Var. β. Minor, antennis totis nigris.

— γ. Tibiis omnibus nigricantibus: annulo testaceo.

Obs.—*Sexus alter rostro mediocri.*

The two insects last described, (namely *Apion assimile,* and *flavifemoratum,*) from their extreme similarity to each other, are very liable to be confounded; if, however, they be carefully examined, they will be found to possess characters sufficiently striking to entitle them to rank as distinct species. In *Apion assimile* (an insect which seems peculiar to *Trifolium ochroleucum*) the body is much narrower than is the case with the other, and not so shining; the space between the eyes, which are scarcely at all prominent, is furrowed, but not very distinctly; the antennæ are piceous at the base; the trunk is nearly cylindrical; and the elytra subelliptical, with furrows slightly drawn. In *Apion flavifemoratum* the space between the eyes is rugulose; the body is wider in proportion than in the preceding; the elytra are

 shining,

shining, black with a very slight æneous tinge, taken together they are subglobose, extremely convex, vaulted, and almost gibbous, with furrows deeper than those of *Apion assimile*; in every other respect it is the counterpart of that species.

Having said what appeared to me necessary to prove that these are distinct species, I shall confine myself in what I have further to observe, to the one last described, *Apion flavifemoratum*, which is by far the most interesting of all, on account of the loss which it occasions to the agriculturist by the havoc it frequently makes in his crops of clover-seed; for the account of which, and of the history and œconomy of this insect, I must refer the reader to the ingenious letters of Messrs. Markwick and Lehmann contained in the 6th volume of the Linnean Society's Transactions*; and next proceed to inquire whether this has a better claim to be considered as the *Curc. Trifolii* of Linné, than *Apion Malvarum*. I must observe that my specimens identify with those sent me by Mr. Markwick as his insect.

The principal reason for regarding *Apion flavifemoratum* as *Curc. Trifolii*, is taken from both of them feeding upon a species of the genus *Trifolium*; but this circumstance, although it may furnish considerable presumptive evidence, is by no means a positive proof that they are synonymous; for we must recollect that Linné's insect feeds upon *T. montanum*, which is not a native of Great Britain, whereas ours is confined to *T. pratense*, attacking no other species: now since, as we have seen above, both *T. repens* and *T. ochroleucum* supply each a peculiar species with food, so probably may *T. montanum*: therefore, before we can be clear as to the identity of the two insects, we must compare ours with Linné's description of his: in this there are two circumstances that will not well accord with *Apion flavifemora-*

* P. 142—150.

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tum—viz. *femora pallida—abdomen niveum* : upon the former of these I will not lay much stress, (though Linné elsewhere* explains the term *pallidus* by *albido-flavus*, and the thighs of the clover weevil are rufo-testaceous,) but the latter will not by any means suit our insect, which has a naked black abdomen; and in the many hundreds of specimens which I have examined, this part has never varied from that colour.

Whether what I have given above as such, or the insect now under consideration, be the true *Attelabus flavipes* of Fabricius seems uncertain; his *Nomen Specificum* defines it *femoribus luteis*, but in his description (which is to be found only in his early work, *Systema Entomologiæ* 133. 33.) he says *pedibus flavis*. In his later works he refers both to Geoffroy and Paykull, the former of whom, by his *Becmare noir à pattes fauves*, evidently intends *Apion flavifemoratum*, since he says *Tout l'animal est d'un noir luisant, à l'exception des cuisses qui sont rougeâtres.* Whereas the latter as evidently had in his eye that which I have before synonymized with *Attelabus flavipes*; this appears by the terms employed in his *Nomen Specificum*, femoribus tibiisque flavis: since this last was sent me as Fabricius's insect by my learned and liberal correspondent Major Gyllenhal, who has better opportunities than I have of knowing his sentiments, I have therefore given it as *Att. flavipes*. It is most probable, however, that Fabricius, in common with other entomologists, has confounded the two species.

I have added a mark of interrogation to the synonym of Panzer, because it seems to me uncertain whether his figure belongs to *Apion flavifemoratum*, or *Apion flavipes*.

Herbst's *Apion flavifemoratum* (sent also by Major Gyllenhal) is synonymous with my variety *β*.

* Faun. Suec. 180. 609.

24. APION

24. APION FILIROSTRE.

A. atrum glabrum, coleoptris subglobosis, rostro pedibusque elongatis.

Long. Corp. $1\frac{1}{3}$ lin.

Habitat in Anglia rarissimum. *Mus.* nostr.

DESCR. CORPUS atrum, glaberrimum, vix nitidum.

CAPUT inter oculos striatulum. *Rostrum* longius, subfiliforme, nitidum, levissimè punctulatum, ante antennas subattenuatum. *Antennæ* breviores, pone medium rostri insertæ. *Oculi* subimmersi.

TRUNCUS subcylindricus, levissimè punctulatus, ante scutellum lineolâ obsoletiùs impressus. *Pedes* elongati. *Scutellum* minutum. *Coleoptra* ex globoso ovata, striata: striis subpunctatis; interstitiis planiusculis.

Obs.—*Sexus alter rostro mediocri; antennis mediis.*

This insect very much resembles *Apion flavifemoratum*, but is at first sight to be distinguished from it by its entirely black legs: I have taken two specimens only of it, upon what plant I did not observe.

25. APION SORBI.

A. atrum glabrum, coleoptris globosis virescenti-cæruleis, rostro longissimo.

Herbst. Natursyst. vii. 111. 9. *t.* 102. *f.* 9—I. eximia.

Attelabus Sorbi. *Fab. Ent. Syst. Em.* i. b. 390. 29. *Syst. Eleuth.* ii. 426. 52. *Payk. Faun. Suec.* iii. 178. 12. *Panz. Faun. Germ. Init.* 20. *t.* 11.

Curculio viridescens. *Marsh. Ent. Brit.* i. 249. 31.

Curculio lævigatus. *Payk. Mon. Curc.* 133.

Long. Corp. 2 lin.

Habitat

Habitat in Angliâ tempore vernali e rarioribus unum. Etiam in Sueciâ et Germaniâ. *Victus—Sorbi Aucupariæ* flores, fructus, succus. *Dom. Herbst. Mus.* nostr. ♂. D. Spence, nostr.

DESCR. CORPUS atrum, glaberrimum, nitidiusculum.

Caput brevissimum, inter oculos rugulosum. *Rostrum* vix corpore brevius, apice paulò dilatatum, ubi antennæ inseruntur utrinque tumidulum. *Antennæ* breviores, pone medium rostro insidentes. *Oculi* immersi.

Truncus subglobosus, punctulatus: punctis confluentibus, posticè dorso profundè canaliculatus. *Scutellum* minutissimum. *Coleoptra* globosa, viridescenti-cærulea, striata: striis quasi acu ductis, subpunctatis: interstitiis latis, planis.

Obs.—*Mas fœmina differt rostro multo breviori, crassiori; antennis brevioribus; elytris obscurioribus nigris: nigrore æneo aut viridi-æneo paululùm tincto.*

Mr. Marsham's description of this insect was made when he was staying with me, from a specimen in my cabinet: neither of us at that time discovered it to be *Attelabus Sorbi* of Fabricius. I have since received it as such from Major Gyllenhal, and upon comparing it with the description of Fabricius, I am convinced that his specimens are rightly named. It is well figured in Panzer, and admirably by Herbst. *Curculio Sorbi* of *Entomologia Britannica* is quite a distinct insect, which I shall hereafter describe. I have looked for this insect upon *Sorbus Aucuparia*, where it was growing wild, but could never meet with it there. I have generally found it in grass: but this circumstance probably was merely accidental. It is a rare insect, particularly that which, upon the authority of Major Gyllenhal, I have given as the male, which has been taken in Britain but once by Mr. Spence.

26. APION

26. APION SUBSULCATUM.

A. atrum glabrum, coleoptris subglobosis cæruleis, rostro mediocri capite inter oculos ruguloso.

Curculio subsulcatus. *Marsh. Ent. Brit.* i. 249. 32.

Apion cæruleum. *Herbst. Natursyst.* vii. 123. 11. *t.* 102. *f.* 11—L?

Long. Corp. 1¼ lin.

Habitat in Angliæ *Viciâ Sepium. Mus.* nostr. Dom. Spence. *β. γ.*

DESCR. CORPUS atrum, glaberrimum, obscuriusculum.

Caput longiusculum, inter oculos rugulosum. *Rostrum* mediocre, filiforme, leviter punctulatum. *Antennæ* mediocres, mediæ, attenuatæ: clavâ elongatiusculâ. *Oculi* subimmersi.

Truncus angustus, brevis, ferè cylindricus, excavato-punctatus, dorso posticè vix, ac ne vix, canaliculatus. *Scutellum* minutissimum. *Coleoptra* subglobosa, amœnè cærulea, subsulcata: sulculis jucundè punctatis; interstitiis planiusculis.

Obs.—*Thorax interdum posticè magis conspicuè canaliculatus.*

Var. *β.* Elytris sulcorum interstitiis convexis.

—— *γ.* Thorace fossulâ aut lineâ nullâ exarato.

—— *δ.* Capite inter oculos trisulco.

Herbst's figure makes the rostrum longer than it is in our specimens; on this account I have added a mark of interrogation to his synonym. *β.* may be distinct, but it differs in nothing but the convexity of the interstices of the *striæ.* I took *δ* upon the bean; it may perhaps be distinct, but it differs in scarcely any point, except the furrows between the eyes.

27. APION FOVEOLATUM.

A. atrum glabrum, coleoptris subglobosis cæruleis, rostro mediocri, fronte impressâ striatâ, thorace canaliculato.

Long.

Long. Corp. 1¼ lin.

Habitat in Succiâ: ex Mus. Dom. Gyllenhal. β. In Anglia: ex Mus. Dom. Lathbury. γ. ex Mus. Dom. Spence.

DESCR. CORPUS atrum, obscurum, subglabrum.

CAPUT inter oculos foveâ impressum, et in foveâ striatulum. *Rostrum* submediocre, crassiusculum, punctulatum. *Antennæ* mediocres, mediæ: clavâ crassiusculâ. *Oculi* subprominuli.

TRUNCUS anticè submarginatus seu coarctatus, excavato-punctatus, dorso posticè canaliculatus. *Scutellum* minutissimum. *Coleoptra* ex obovato subglobosa, cærulea, pilositate quâdam brevissimâ, et nisi sub lente forti vix conspicuâ, obscurata, subsulcata: sulculis punctatis; interstitiis planiusculis.

Var. β. Frontis foveâ impressiori canaliculatâ, antennis rostro longioribus, corporis pilositate magis conspicuâ, thorace anticè vix coarctato. An idem?

—— γ. Rostro longiori nitido, in medio supra inter antennas puncto impresso, corpore glabriori.

Obs.—*Frontis fovea nisi a latere vix conspicienda.*

This insect is very similar to *Apion subsulcatum*, but the head is wider, the eyes more prominent, and the space between them hollowed out into a concavity with one or more furrows; the thorax or trunk, also, is of a shape rather different and wider, with a much stronger dorsal furrow. A. differs from β. and γ. more than the sexes usually do, and may possibly be distinct; yet they are so extremely similar to each other, that I judged it best not to separate them. The former was sent me from Sweden as *Attelabus cyaneus* of Fabricius, and *Apion sulcifrons* of Herbst, but I cannot think it is either. The character of *At. cyaneus*—*thorax utrinque tuberculo elevato*—evidently does not belong to this

MISSOURI
BOTANICAL

this species, and it certainly is not Herbst's insect, which we shall shortly describe, whose admirable figure clearly points out the species he meant. The impressed point on the rostrum of Var. γ. may perhaps be accidental.

28. APION PUNCTIFRONS.

A. atrum glabrum, coleoptris subglobosis cæruleis, rostro mediocri, capite latiusculo inter oculos punctulato. *Tab.* 1. *fig.* 9.

Long. Corp. 1⅓ lin.

Habitat in Angliâ semel lectum. *Mus.* nostr.

DESCR. CORPUS atrum, glaberrimum.

Caput longius et latius quàm in plerisque præcedentibus, posticè nitidum læve, inter oculos excavato-punctatum. *Rostrum* submediocre, punctulatum, crassiusculum. *Antennæ* mediocres, mediæ. *Oculi* prominuli.

Truncus discretè excavato-punctatus, posticè dorso canaliculatus. *Scutellum* satis conspicuum. *Coleoptra* subglobosa, cærulea, sulcata: sulculis jucundè punctatis; interstitiis convexiusculis.

The insect I have here described is of the same habit with the two preceding ones, yet very distinct from either. The head is both wider and longer; the space between the eyes is punctulate; and the furrows of the elytra are wider and deeper with convex interstices.

29. APION SULCIFRONS.

A. atrum glabrum, coleoptris subglobosis cæruleis, rostro mediocri: basi crassiori, capite inter oculos trisulco.

Herbst. Natursyst. vii. 132. 25. *t.* 103. *f.* 12—M. eximia.
Attelabus punctiger. *Payk. Faun. Suec.* iii. 179. 13.

Long.

Long. Corp. 1¼ lin.

Habitat in Angliæ *Viciâ sepium*, tempore vernali obvium. *Mus.* nostr.

DESCR. CORPUS atrum, glaberrimum.

CAPUT inter oculos sulcato-striatum; sulculis circiter tribus. *Rostrum* mediocre, pone antennas crassius obscurius, apice nitidum. *Antennæ* mediocres, pone medium rostri insertæ: clavâ majusculâ. *Oculi* prominuli.

TRUNCUS subcylindricus, punctulis sine lente forti vix conspicuis levissimè notatus, unde lævior, quàm in plerisque, evadit, anticè paulò angustior, dorso obsoletiùs canaliculatus. *Scutellum* minutum. *Coleoptra* ex globoso obovata, nigro-cærulea, striata: striis punctatis; interstitiis convexiusculis.

Obs.—*In altero sexu rostrum brevius.*

Herbst's figure so happily expresses the characters of this little insect, that it seems not easy to mistake it; yet his description would agree perhaps as well with *Apion foveolatum*, which, as I observed before, was sent me for it from Sweden. It is principally distinguished from the three preceding species by having its rostrum thicker from the point where the antennæ are inserted to the head (a circumstance not omitted in the figure above quoted); by its thorax so slightly punctulate as to appear nearly without points under a single lens; by its elytra, which, taken together, approach more to an obovate shape: besides this, three furrows are very conspicuous between the eyes. It is not uncommon upon *Vicia sepium*, and I do not find it upon any other plant. Major Gyllenhal sends it as *Attel. punctiger* of Paykull: I had before regarded that as synonymous with *Ap. aterrimum*, but I yield to his authority.

30. APION STRIATUM.

A. atrum piloso-subincanum, coleoptris globosis sulcatis, thorace canaliculato. *Tab.* 1. *fig.* 10.

Curculio striatus. *Marsh. Ent. Brit.* i. 249. 30.

Attelabus Pisi. *Fabr. Syst. Eleuth.* ii. 425. 50.

Long. Corp. $1\frac{3}{4}$ lin.

Habitat in Angliâ rarissimum. *Mus.* nostr.

DESCR. CORPUS atrum, pilositate parvâ albicanti obscurum.

CAPUT latiusculum, inter oculos ruguloso-punctatum. *Rostrum* mediocre, nitidiusculum, leviter punctulatum. *Antennæ* mediocres, pone medium rostro insidentes. *Oculi* subprominuli.

TRUNCUS coleoptris multò angustior, punctulatus, dorso canaliculatus. *Scutellum* minutissimum, et vix sub lente conspicuum. *Coleoptra* globosa, profundè sulcata: sulcis punctatis; interstitiis planiusculis.

31. APION IMMUNE.

A. atrum piloso-subincanum, coleoptris globoso-cuneiformibus sulcatis.

Long. Corp. 1—$1\frac{1}{4}$ lin.

Habitat in Angliæ *Spartio* et *Ulice*. *Mus.* nostr.

DESCR. CORPUS atrum, ex pilositate parvâ albicanti subobscurum.

CAPUT inter oculos striatum. *Rostrum* mediocre, leviter punctulatum, nitidum. *Antennæ* mediocres, pone medium rostri insertæ. *Oculi* subprominuli.

TRUNCUS ex globoso teretiusculus, punctulatissimus; punctulis ferè confluentibus, haud canaliculatus, sed puncto majori impresso ante scutellum notatus. *Scutellum* minutissimum. *Coleoptra* ex globoso obcuneata:

ano

ano obtusissimo, sulcata: sulculis punctatis; interstitiis modicè convexis.

Var. β minor; rostro breviori.

This little insect is very nearly related to the preceding; it is however considerably smaller, the head between the eyes has two or three little furrows, the thorax has no dorsal channel, and the elytra, taken together, are longer in proportion. Var. β. is scarcely half the size of α.

32. APION VIRENS.

A. atrum, coleoptris oblongo-ovatis cæruleis viridescentibusve striatis: striâ suturali profundiori, thorace læviusculo.

Var. β.

Herbst. Natursyst. vii. 128. 18. *t.* 103. *f.* 6—E?

Long. Corp. 1¼—1‴.

Habitat in Angliæ sepibus. *Mus.* nostr.

DESCR. CORPUS atrum, glabriusculum, nitidiusculum.

CAPUT vix punctatum, inter oculos rugulosum, in recenti insecto atrum cum levissimâ tincturâ æneâ. *Rostrum* mediocre, nitidum. *Antennæ* mediocres, pone medium rostri insertæ. *Oculi* subprominuli.

TRUNCUS ater, nigrore, in recenti insecto, leviter æneo infecto, nisi sub lente forti vix conspicuè punctulatus, puncto majori dorsali ante scutellum notatus. *Scutellum* minutissimum. *Coleoptra* ex oblongo obovata, cærulea, sulcata: sulculo suturali in medio reliquis profundiori, in sulculis puncta impressa, interstitia sulculorum convexiuscula.

Var. β. minor, capite thoraceque nigro-æneis, elytris viridescentibus.

It is not easy to judge from figures of these minute insects,

the

the distinctions of which cannot always be represented by the pencil, what species the author intends: that which Herbst has given of *Apion virens*, would agree equally well with several others; but, in his description, he mentions one circumstance which seems to justify my referring to him for the insect now before us. The head and thorax, he says, have a slight metallic tint, a character observable in both varieties of our *Apion virens*, and not common in the genus; in *α.* it fades, in the dead specimens, to nearly a black, but in *β.*, which appears to be Herbst's insect, it is more permanent.

33. APION MARCHICUM.

A. atrum, coleoptris oblongo-ovatis atro-cæruleis striatis: striâ suturali profundiori, rostro brevi crassiusculo.

Herbst. Natursyst. vii. 128. 19. *t.* 103. *f.* 7—G?

Long. Corp. 1¼ lin.

Habitat in Angliâ. *Mus.* nostr.

DESCR. CORPUS atrum, glaberrimum, nitidiusculum.

Caput inter oculos trisulcum. *Rostrum* brevius, crassiusculum. *Antennæ* longiores, mediæ. *Oculi* prominuli.

Truncus subcylindricus, leviter punctulatus: puncto majori dorsali posticè insuper notatus. *Scutellum* minutissimum. *Coleoptra* ex oblongo obovata, cærulea, sulcata: sulculo suturali in medio profundiori, in sulcis puncta impressa.

Obs.—*Sulculi frontales nisi sub triplici lente vix detegendi, interdum omnino absunt.*

This little insect is so similar to the one before it, that I suspect it may be only a sexual variety. The principal difference lies in the thickness and shortness of its rostrum, and in the three

three little furrows usually observable in the space between its eyes. It answers tolerably well to Herbst's figure and description of his *Apion marchicum*, which, he observes, very much resembles *Apion virens*.

34. APION EBENINUM.

A. aterrimum nitidum, coleoptris ovatis sulcatis, thorace lateribus subgibbosis posticè latiùs canaliculato. *Tab.* 1. *fig.* 11.

Apion ebeninum. *Mus.* Dom. Gyllenhal.

Long. Corp. $1\frac{1}{4}$ lin.

Habitat in Sueciâ, Angliâ. Apud Blakenham Magnam prope Gippovicum Julio medio 1806 bis lectum.

DESCR. CORPUS aterrimum, nitidum, glaberrimum.

CAPUT inter oculos, sed vix conspicuè, striatum, punctulis insuper quibusdam notatum, posticè transversè elevatum. *Rostrum* mediocre, apice et medio subdilatatum, leviter arcuatum, sub lente forti punctula minutissima per totam ejus longitudinem sunt conspicienda. *Antennæ* subbreviores, mediæ. *Oculi* subimmersi.

TRUNCUS angustus, anticè et posticè subattenuatus, utrinque anteriùs gibbus, discretè punctulatus, ante scutellum sulco latiori quam in reliquis exaratus. *Scutellum* minutissimum. *Coleoptra* ovata, sulcata: sulcis punctatis; interstitiis vix ipsis sulcis latioribus valde convexis.

Obs.—*Maris rostrum brevius robustius.*

35. APION ASTRAGALI.

A. æneum nitidum, coleoptris oblongo-ovatis cyaneis, thorace canaliculato. *Tab.* 1. *fig.* 12.

Attelabus

Attelabus astragali. *Payk. Faun. Suec.* iii. 180. 15.

Long. Corp. 1½ lin.

Habitat in foliis *Astragali glycyphylli* in Kinnakulle Westro-Gothiæ. *Dom. Gyllenhal. Mus.* nostr.

DESCR. CORPUS æneum seu viridi-æneum, glâbrum, nitidum.

Caput inter oculos rugulosum. *Rostrum* mediocre, atrum, nitidum. *Antennæ* mediocres, pone medium rostri insertæ. *Oculi* vix prominuli.

Truncus discretè punctulatus, dorso in medio canaliculatus. *Tarsi* nigri. *Scutellum* minutissimum. *Coleoptra* ovata, amœnè cyanea, interdum violacea, striata: striis punctatis interstitiis vix convexis.

Var. β. Elytris viridibus.

This is one of the most elegant species of this genus; it was sent me from Sweden by Major Gyllenhal, from whom Paykull originally received it. *Astragalus glycyphyllus* is common in my neighbourhood, but I have not yet met with this little insect upon it.

36. APION SPARTII.

A. atrum glabrum, coleoptris obovatis, atro-cæruleis, fronte punctatâ, rostro mediocri.

Long. Corp. 1 lin.

Habitat in *Spartio* sed rariùs. *Mus.* nostr.

DESCR. CORPUS atrum, glaberrimum, minùs nitidum.

Caput latiusculum, inter oculos punctulatum: punctis confluentibus. *Rostrum* mediocre, filiforme, nitidiusculum, per totam longitudinem punctulatum. *Antennæ* mediocres, mediæ. *Oculi* subimmersi.

Truncus

Truncus vix capite latior, subcylindricus, discretè sed leviter punctatus, puncto insuper majori ante scutellum notatus. *Scutellum* minutum. *Coleoptra* obovata, posticè gibbosiuscula, striata: striis impressè punctatis; interstitiis convexiusculis.

37. APION SPENCII.

A. atrum piloso-obscurum, thorace canaliculato, coleoptris oblongis atro-cæruleis, fronte striata, rostro piloso. *Tab.* 1. *fig.* 13.

Long. Corp. $1\frac{1}{4}$ lin.

Habitat in Angliâ. A Dom. Spence semel lectum. *Mus.* D. Spence.

DESCR. CORPUS atrum, ex pilositate albidâ obscurum.

Caput inter oculos trisulcum. *Rostrum* submediocre, crassiusculum, reliquo corpore magis pilosum. *Antennæ* pone medium rostri in fossulâ insertæ, longiores. *Oculi* magni, ovales, prominuli.

Truncus brevis, anticè angustior, ex globoso teres, punctatus: punctis impressis subconfluentibus, suprà medio canaliculatus, posticè utrinque foveâ obsoletiusculâ. *Coleoptra* obovato-oblonga, atro-cærulescentia, striata: striis concinnè punctatis; interstitiis planis.

This species bears considerable resemblance to the preceding, but it is much larger, and hairy; the eyes are proportionally larger, between which, under a good lens, may be discerned three little furrows, not discoverable in *Apion Spartii*. The thorax also is canaliculate, with larger *puncta*, and more deeply impressed. It stands unique in the collection of my friend William Spence, Esq. F.L.S., whose name it bears; a tribute justly due to one of the most acute and learned entomologists of this island.

38. APION

38. APION LOTI.

A. nigrum piloso-subincanum, coleoptris obovatis, rostro longiori.

Long. Corp. $1\frac{1}{3}$ lin.

Habitat in Angliæ *Loto corniculato. Mus.* nostr.

DESCR. CORPUS nigrum, nitidiusculum, ex pilositate parvâ subincanum.

Caput punctulatum: rugulis 2 seu 3 inter oculos. *Rostrum* longius, arcuatum, filiforme, nitidissimum. *Antennæ* breviores pone medium rostri insertæ. *Oculi* subimmersi.

Truncus ex globoso teretiusculus, confluenter punctulatus, puncto majori excavato ante scutellum notatus. *Scutellum* minutum. *Coleoptra* obovata, striata: striis punctatis; interstitiis convexis.

39. APION UNICOLOR.

A. atrum subpilosum, coleoptris oblongis, rostro mediocri subcrassiori.

Long. Corp. $1\frac{1}{4}$ lin.

Habitat in Angliâ. *Mus.* Dom. Spence.

DESCR. CORPUS angustum satis, atrum, subpilosum.

Caput thorace paulò brevius, punctulatum, inter oculos bistriatum: striolis approximatis. *Rostrum* mediocre, crassiusculum, leviter punctulatum, reliquo corpore magìs pilosum, apice nitidum, medio paulò incrassatum et subtùs tumidulum seu gibbum, suprà inter antennas puncto gemino elevato notatum. *Oculi* subimmersi. *Antennæ* submediocres pone medium rostri insertæ.

Truncus anticè capitis latitudine, posticè transversè subdepressus

depressus et latior, excavato-punctatus, lineolâ ante scutellum exaratus. *Coleoptra* oblonga, apice obtusè subacuminata, sulcato-striata: striis punctatis; interstitiis convexis.

This insect comes very near to *A. Loti*, but the rostrum is considerably thicker, somewhat tumid in the middle, and underneath (just before the insertion of the antennæ) gibbous; it is distinguished likewise, if this circumstance be not accidental, by a pair of minute elevated points between the antennæ. The head, viewed from before, has two little striæ between the eyes; and the thorax has not the smallest tendency to a globose figure.

40. APION ATOMARIUM.

A. atrum piloso-incanum, coleoptris ovatis, rostro longiori, thorace brevi. *Tab.* 1. *fig.* 14.

Apïon atomarium *Mus.* Dom. Gyllenhal.

Long. Corp. ⅔ lin.

Habitat in Sueciâ. *Mus.* nostr.

DESCR. CORPUS atrum, totum pilis albicantibus incanum.

Caput breve. *Rostrum* longius, valde arcuatum, filiforme, læve, nitidum, glabrum, basi lineâ transversâ elevatiusculâ. *Antennæ* posticæ, breviores. *Oculi* magni, subimmersi.

Truncus brevissimus, ex globoso teretiusculus, posticè paulò latior, lineolâ punctove dorsali ante scutellum aut obsoleto aut nullo. *Coleoptra* ovata, striata: striis punctatis; interstitiis convexiusculis.

This is the most minute species of this genus, with which I am at present acquainted. It was sent me by my liberal friend Major Gyllenhal, and is clearly distinct from every other.

41. APION ATERRIMUM.

A. atrum glabrum, coleoptris subovatis nitidiusculis atro-cæruleis, rostro mediocri.

Curculio aterrimus. *Linn. Syst. Nat. Ed.* 12. 607. 10. *Faun. Suec.* 582.

Apion Æthiops. *Herbst. Natursyst.* vii. 130. 21. *t.* 103. *f.* 9. I.

Long. Corp. 1¼ lin.

Habitat in Sueciâ, Germaniâ. *Mus.* Linn.

DESCR. CORPUS aterrimum, glabrum.

Caput thoracis ferè latitudine, inter oculos rugulosum. *Rostrum* mediocre, filiforme, pone antennas punctulatum, apice nitidiusculum. *Antennæ* mediocres, mediæ. *Oculi* subimmersi.

Truncus punctulatus, lineolâ dorsali nullâ. *Coleoptra* subovata, nitidè nigra seu potiùs atro-cærulea, subsulcata: sulculis concinnè punctatis; interstitiis planiusculis.

The label affixed to the specimen of this insect preserved in the Linnean cabinet appears to be the hand-writing of the younger Linné; it agrees, however, so well with the father's description of his *Curc. aterrimus,* that I have little doubt of its being synonymous with it. That which Fabricius has given for *C. aterrimus* is a very different insect*, belonging to the Linnean division, *Longirostres femoribus dentatis,* which appears to be the same with Mr. Marsham's *Curc. atramentarius*†. Herbst's description of his *Apion Æthiops* answers to our insect in every particular. Mr. Marsham's *Curc. aterrimus* is a different species, which

* *Ent. Syst. Em.* i. b. 439. 189. *Syst. Eleuth.* ii. 486. 225. Rhynchænus.

† *Marsh. Ent. Brit.* i. 293. 163.

I shall

I shall soon notice. Gmelin has omitted *Apion aterrimum* altogether.

42. APION TENUE.

A. aterrimum angustum subglabrum nitidiusculum, coleoptris oblongis, rostro mediocri.

Long. Corp. 1 lin.

Habitat in Angliâ rariùs. *Mus.* nostr.

DESCR. CORPUS tenue, nitidiusculum, aterrimum, nigrore pube quâdam parvâ (nisi sub lente forti vix distinctè conspicuâ) paululùm obscurato.

Caput thorace paulò brevius, punctatum punctis confluentibus. *Rostrum* mediocre, nitidum. *Antennæ* sublongiores, pone medium rostro insidentes. *Oculi* prominuli.

Truncus cylindricus, vix capite latior, punctulatus, puncto majori dorsali posticè notatus. *Scutellum* minutissimum. *Coleoptra* oblonga, striata: striis subpunctatis; interstitiis planiusculis.

43. APION SENICULUS.

A. atrum angustum piloso-canescens, coleoptris ovato-oblongis, rostro longiori.

Long. Corp. 1¼ lin.

Habitat in Angliâ semel lectum, in Sueciâ frequentiùs. *Mus.* nostr.

DESCR. CORPUS tenue, atrum, pilis brevissimis decumbentibus albidis incanum.

Caput thorace brevius, inter oculos vix punctatum. *Rostrum* longius, nitidum. *Antennæ* mediocres, pone medium rostri insertæ. *Oculi* prominuli.

Truncus

Truncus posticè paulò latior; anticè margine ex pilis tenuissimè albo, levissimè punctulatus, puncto insuper majori ante scutellum notatus. *Scutellum* minutissimum. *Coleoptra* oblongo-ovata, leniter striata: striis subpunctatis; interstitiis planiusculis.

Obs.—*Alter sexus rostro mediocri.*

This insect and the preceding are very nearly related, but the species now described is quite hoary with down or hair; its head is shorter than that of *Apion tenue*; its thorax proportionally wider, and the rostrum longer. The body of both is remarkably slender.

44. APION CONFLUENS.

A. atrum angustum piloso-subincanum, coleoptris oblongo-ovatis, fronte bisulco, antennis posticis, rostro mediocri. *Tab.* 1. *fig.* 15.

Long. Corp. $1\frac{1}{8}$ lin.

Habitat in Angliâ semel lectum. Ex *Mus.* Dom. Sheppard.

DESCR. CORPUS atrum, tenue, pilositate parvâ leviter incanum.

Caput læviusculum, inter oculos sulculis duobus postice approximatis, vel ferè in literæ V figuram confluentibus profundiùs exaratum. *Rostrum* mediocre, nitidum. *Antennæ* posticæ, sublongiores. *Oculi* prominuli.

Truncus capite vix latior, leviter punctulatus, lineolâ dorsali posticâ exaratus. *Scutellum* minutum. *Coleoptra* oblongo-ovata, subnitida, striata: striis levissimè punctatis.

In habit this little *Apion* agrees with *Ap. tenue* and *Seniculus*, it is nevertheless quite distinct from them. It was taken by my indefatigable friend, and the pleasant companion of many an entomological walk, the Rev. Revett Sheppard, F.L.S.

45. APION

45. APION GYLLENHALII.

A. atrum subangustum piloso-obscurum, coleoptris oblongiusculis, antennis piceis, rostro longiori.

Apion Pisi. *Mus.* Dom. Gyllenhal.

Curculio flavipes β. γ. *Payk. Mon. Curc.* 144. 135.

Attelabus flavipes β. γ. *Payk. Faun. Suec.* iii. 182. 17.

Long. Corp. 1⅔ lin.

Habitat in Sueciâ, in foliis *Betulæ albæ.* Dom. Paykull. *Mus.* D. Marsham. M'Leay. Nostr.

DESCR. CORPUS atrum, subangustatum, pilositate quâdam cinerascenti obscurum.

Caput valde angustum, vix rostro latius, elongatum, confluenter punctulatum, inter oculos ruguloso-striatulum, posticè transversè elevatum. *Rostrum* longius, filiforme, leniter arcuatum, punctulatum. *Antennæ* mediocres, mediæ, nigro-piceæ basi rufescentes. *Oculi* immersi.

Truncus brevis admodum, ferè cylindricus, excavato-punctatus: punctis subconfluentibus, lineolâ dorsali posticè exaratus. *Coleoptra* ex ovato oblonga, striata: striis punctatis; interstitiis planiusculis.

Var. β. Corpore minùs piloso, elytris atro-cæruleis.

Major Gyllenhal sends me this insect for *Attelabus Pisi* of Fabricius, and likewise regards it as synonymous with *Apion Æthiops* of Herbst: yet, with all deference to the authority of so judicious and skilful an entomologist, I must venture to dissent from him upon this occasion, for this insect does not appear to me to answer the description of either of these authors. Fabricius says of his *Att. Pisi* "coleoptris globosis," a character which will not well suit *Apion Gyllenhalii,* whose elytra, taken

together,

together, are oblong rather than globose, but agrees perfectly with *Apion striatum*, which I have given above as synonymous with it. Herbst's description of *Apion Æthiops* agrees better with *Apion aterrimum*, to which I have referred it, than with the insect before us, for, he says, the thorax has no impressed *stria*; and, moreover, so accurate and minute a describer would not have overlooked the hair on the body, or the unusual colour of the antennæ. On these accounts I have given this as a new species, and named it after the kind and liberal friend and correspondent, as well as learned and experienced entomologist, who sent it me.

Paykull has considered it as a variety of *Apion flavipes*, expressing, however, a suspicion that it may be distinct: it has certainly no relation, except being of the same genus, to that species. Major Gyllenhal regards Var. *β.* (which is *Attel. flavipes γ* of Paykull) as Herbst's *Ap. marchicum*; the insect which I have given above under that name, is more nearly related to *Ap. virens*, which makes me consider my reference as most correct, since Herbst says that it is uncommonly like that species.

46. APION MELILOTI.

A. atrum subangustum, coleoptris obovatis viridescenti-cæruleis, antennis mediis, rostro longiori.

β. Apion angustatum. Mus. Dom. Gyllenhal.

Long. Corp. 1¼ lin.

Habitat in Angliæ *Trifolio Meliloto* rariùs. *β.* in Sueciâ. *Mus.* nostr.

DESCR. CORPUS atrum, tenuiusculum, pilositate parvâ rariùs conspersum.

Caput vix thorace brevius, punctulatum, inter oculos rugulosum

rugulosum foveolâ nisi a latere vix conspicuâ subimpressum. *Rostrum* longius, filiforme, valde arcuatum, nitidum. *Antennæ* mediocres, mediæ. *Oculi* subprominuli.

TRUNCUS punctulatus, posticè lineolâ dorsali exaratus. *Scutellum* minutissimum. *Coleoptra* obovata, viridescenti-cærulea, sulcato-striata: striis punctatis; interstitiis planiusculis.

Var. β piloso-subincanum, elytris corpori concoloribus. An idem?

47. APION VIOLACEUM.

A. atrum glabrum, coleoptris oblongo-obovatis violaceis, rostro brevi crassiusculo. *Tab.* 1. *fig.* 16.

Apion cyaneum. *Herbst. Natursyst.* vii. 108. 7. *t.* 102. *f.* 7—G. *Arch.* iv. *t.* 24. *f.* 5.

Curculio Fagi Var. *Mus.* Linn.

Long. Corp. 1¾ lin.

Habitat in Angliâ, Sueciâ. Apud Kesgrave prope Gippovicum in terram apud Hunstanton in Norfolciâ in *Rumice* lectum. *Mus.* nostr.

DESCR. CORPUS atrum, glaberrimum.

CAPUT thorace paulò brevius et angustius, inter oculos ex punctis confluentibus rugulosum et obsoletè canaliculatum. *Rostrum* brevius, crassum magìs quàm in hoc genere plerumque accidit, punctulatum: apice summo lævi nitidissimo. *Antennæ* posticæ, sublongiores: clavâ admodùm crassâ. *Oculi* subprominuli.

TRUNCUS cylindricus ferè, punctulatissimus, puncto insuper excavato dorsali ante scutellum notatus. *Scutellum* minutissimum. *Coleoptra* ex oblongo obovata, amœnè violacea, molliuscula, ex pube parvâ (nisi sub lente

lente forti haud conspicuâ) obscura, sulcato-striata: striis punctatis; interstitiis convexiusculis.

Herbst's *Apion cyaneum* appears to be a variety of this insect with blue elytra. It cannot be *Attel. cyaneus* of Fabricius, as this author indeed suspects, because it wants the tubercles on the thorax, peculiar to that species; which also is clearly not *Curc. cyaneus* of Linné, though given as such; for two characters mentioned in *Faun. Suec.* (581) are quite at variance with the Fabrician insect, viz. *Pedes ferruginei. Scutellum punctum album.* There is no specimen of *Curc. cyaneus* now in the Linnean cabinet. *Apion violaceum*, in that collection, is gummed upon the same paper with *Apion Fagi*, from which it should seem that Linné regarded it (although he no where notices it) as a variety merely of that insect. It certainly agrees with it in habit and shape, but the different colour of the legs and elytra seems to furnish a sufficient distinction. There are no beech trees in the neighbourhood of the place where I first took it.

48. APION HYDROLAPATHI.

A. atrum glabrum, coleoptris oblongo-obovatis cæruleis viridescentibusve, rostro brevi crassiusculo. *Tab.* 1. *fig.* 17.

Curculio Hydrolapathi. *Marsh. Ent. Brit.* i. 249. 33.

Long. Corp. $1\frac{1}{3}$—$1\frac{3}{4}$.

Habitat in Angliæ *Rumicibus Lapathis* frequens. *Mus.* nostr.

DESCR. CORPUS atrum, glaberrimum.

Caput thoracis ferè longitudine et latitudine, punctatum, inter oculos ex punctis confluentibus confertim striatum. *Rostrum*, pro hoc genere, brevissimum, nec capite longius, punctulatissimum, obscurum, suprà planiusculum. *Antennæ* pone medium rostri insertæ, longiores: clavâ crassiusculâ. *Oculi* subprominuli.

Truncus subcylindricus confluenter punctulatissimus, lineolâ

lineolâ dorsali, posticè impressiori, longitudinaliter exaratus. *Scutellum* minutissimum. *Coleoptra* ex oblongo obovata, cærulea aut viridescentia, nitidiuscula, striata: striis punctatis; interstitiis planiusculis.

This insect is nearly related to the preceding species, but the rostrum is shorter in proportion; the thorax, instead of an impressed point, has a longitudinal furrow; the elytra of the male are blue, and those of the female green; the furrows also of the elytra are more lightly drawn, with flat interstices. When I originally sent this species to Mr. Marsham, I had observed it only upon water dock; I have since taken it, and more plentifully, upon the common dock, so that perhaps its trivial name might better be *Apion Lapathorum.*

49. APION RUMICIS.

A. atrum subglabrum nitidiusculum, coleoptris obovatis obtusis violaceis nigrisve, rostro mediocri.

Long. Corp. $1\frac{1}{4}$ lin.

Habitat in Angliæ *Rumice obtusifolio.* *Mus.* nostr.

DESCR. CORPUS atrum, subglabrum, nitidiusculum.

Caput breve, punctulatum. *Rostrum* mediocre, punctulatum, crassiusculum. *Antennæ* mediæ, sublongiores: clavâ crassiusculâ. *Oculi* vix prominuli.

Truncus discretè punctulatus, lineolâ dorsali posticè exaratus. *Scutellum* minutum, at satis conspicuum. *Coleoptra* obovata, atro-violacea, obtusa, striata: striis punctatis; interstitiis planiusculis.

Var. β. Totum atrum, rostro quàm in α crassiori et paulò breviori.

50. APION AFFINE.

A. atrum glabrum nitidiusculum, coleoptris obovatis obtusis viridescentibus, rostro breviori crassiusculo.

Long. Corp. $1\frac{1}{4}$ lin.

Habitat in Angliâ a Dom. Spence lectum. *Mus.* D. Spence. Nostr.

DESCR. CORPUS atrum, glabrum, nitidulum.

Caput magnum satis, punctulatum. *Rostrum* brevius, admodùm crassum, subfiliforme. *Antennæ* mediæ mediocres; clavâ crassiusculâ. *Oculi* subprominuli.

Truncus ex globoso teretiusculus, excavato-punctulatissimus, ante scutellum puncto majori seu lineolâ exaratus. *Coleoptra* ex globoso obovata, viridescentia, apice obtusa, striata: striis punctatis; interstitiis planis.

Obs.—*Alter sexus rostro mediocri tenuiori.*

This species is closely allied to the preceding; it differs principally in size, being considerably larger; the head is bigger in proportion; the thorax inclines more to a globose form, and the elytra are of a different colour, and proportionally wider.

51. APION BREVIROSTRE.

A. atrum obscurum subpilosum, coleoptris subovatis, rostro breviori crassiusculo.

Herbst. Natursyst. vii. 130. 22. *t.* 103. *f.* 10—K ?

Long. Corp. $1\frac{1}{3}$ lin.

Habitat in Angliâ, Sueciâ, Germaniâ. *Mus.* nostr.

DESCR. CORPUS atrum obscurum, pilositate parvâ leviter incanum.

Caput punctatum, inter oculos ex punctis confluentibus rugulosum. *Rostrum* brevius, crassiusculum, punctatum, apice

apice nitidum. *Antennæ* mediæ, longiores: clavâ crassiusculâ. *Oculi* vix prominuli.

TRUNCUS subcylindricus, excavato-punctatus, lineolâ dorsali posticè exaratus. *Scutellum* minutissimum. *Coleoptra* subovata, sulcata: sulculis punctatis; interstitiis planiusculis.

There is considerable affinity between the present species and that which precedes it; but it is hairy, the rostrum is shorter and thicker, and the furrows of the elytra are more deeply drawn. It was sent me by Major Gyllenhal as the *Apion brevirostre* of Herbst, yet it does not altogether agree with that author's description; for he says of his: "The thorax is rather broad, without the impressed stria. The elytra have a viridi-æneous tint, and fine furrowed striæ—it is not easy to see whether they are punctured." These characters are not to be found in our insect, in which the thorax is narrow, with an impressed stria behind. Its elytra have no viridi-æneous tint, and the punctures of the striæ are sufficiently visible.

52. APION HOOKERI.

A. atrum obscuriusculum, thorace globoso. *Tab.* 1. *fig.* 18.

Long. Corp. 1¼ lin.

Habitat in Angliâ, a Dom. W. J. Hooker bis lectum. *Mus.* D. Hooker. Nostr.

DESCR. CORPUS atrum, ex pube parvâ haud facilè conspicuâ obscurum.

CAPUT brevissimum, inter oculos læviusculum. *Rostrum* mediocre, pone antennas paulò incrassatum. *Antennæ* mediocres, posticæ. *Oculi* subimmersi.

TRUNCUS globosus, punctulatissimus posticè lineolâ vix

bene

bene conspicuâ exaratus. *Coleoptra* oblongiuscula, certo situ et sub luce viriditate levissimâ imbuta, striata: striis punctatis; interstitiis planis.

This species seems nearly related to a North American *Apion*, described by Herbst under the name of *Apion nigrum*, (*Natursyst*. vii. 132. 24. *t*. 103. *f*. 11—L.) but if, by the term "granulated," he means that the thorax is covered with elevated points, his insect is materially different from ours.

I am indebted to the kindness of an excellent naturalist, Mr. W. J. Hooker of Norwich, who first discovered it, for this species. Many other nondescripts have been taken by him and his brother Mr. J. Hooker, and I name this insect after them as a memorial of my sense of their ability and exertions in the service of my favourite department in natural history.

53. APION LÆVIGATUM.

A. atrum læviusculum, coleoptris ovatis violaceis obsoletè striatis.

Long. Corp. 1¼ lin.

Habitat in Angliâ rarissimè. In arenario quodam prope Gippovicum a Dom. Sheppard bis lectum. *Mus*. D. Sheppard.

DESCR. CORPUS lanceolatum, glaberrimum, læviusculum, atrum.

Caput inter oculos striatulum: striolis 4 seu 5. *Rostrum* longius. *Antennæ* longiores, posticæ, nitidiusculæ: clavâ parvâ admodùm.

Truncus cylindricus: dorso lævi; lateribus punctulatis. *Pedes* pilis albidis rariùs adspersi. *Scutellum* minutissimum. *Coleoptra* obovata, amœnè violacea, substriata: striis levissimè impressis attamen punctatis.

This insect, taken only by Mr. Sheppard, is one of the most distinctly

distinctly marked, and at the same time one of the most elegant, species of the genus. It appears never to have been noticed before.

54. APION ONOPORDI.

A. atrum glabrum, coleoptris ovatis nitidè viridi-æneis cærulescentibusve, thorace scabro.

Long. Corp. $1\frac{3}{4}$ lin.

Habitat in Angliæ *Onopordo* frequens. *Mus.* nostr.

DESCR. CORPUS atrum, glabrum, nitidiusculum.

Caput breve, punctatum, posticè elevatum, anticè depressum, inter oculos rugulosum seu punctatum punctis confluentibus. *Rostrum* mediocre, apice nitidum, pone antennas pauló incrassatum. *Antennæ* sublongiores, posticæ: clavâ ovatâ. *Oculi* prominuli.

Truncus subcylindricus, punctis magnis valde excavatis confluentibus scaber, posticè lineolâ dorsali profundiùs exaratus. *Scutellum* minutissimum. *Coleoptra* ovata, viridi-æneo nitidula, sulcata: sulculis subpunctatis; interstitiis planiusculis.

Obs.—*Alt. Sex. Rostro longiori.*

Var. *β.* Elytris viridi-cærulescentibus.

—— *γ.* ——— atro-cæruleis.

Panzer's figure of what he gives for *Attelabus Craccæ* of Fabricius (*Faun. Germ. Init.* 20. *t.* 10.) is very similar to this insect; but since his is found upon *Vicia Cracca* and other vetches, and ours only upon *Onopordum Acanthium*, I imagine we mean distinct species. Sometimes the hinder part of the head is drawn into the thorax, in which case it does not show the elevated part.

55. APION

55. APION CARDUORUM.

A. atrum, coleoptris ovatis obscuris viridescentibus cæruleisve, rostro basi utrinque gibbo. *Tab.* 1. *fig.* 19.

Curculio Sorbi. *Marsh. Ent. Brit.* i. 244. 15.

Curculio cyaneus. *De Geer.* v. 252. 41.

Attelabus æneus β. *Payk. Faun. Suec.* iii. 180. 14.

Apion gibbirostre. *Mus. Dom. Gyllenhal.*

Apion Alliariæ. *Herbst. Natursyst.* vii. 104. 3. *t.* 102. *f.* 3—C?

Long. Corp. 1¼ lin.

Habitat in Angliæ *Carduis* frequens, item in Sueciâ. *Mus.* nostr.

DESCR. CORPUS atrum, pilositate parvâ obscurum.

Caput inter oculos striato-rugulosum, foveâ leviter impressum. *Rostrum* longius, punctulatum, apice nitidum, basi latius, et insuper utrinque dente brevi seu tuberculo acutiusculo, quo insidunt antennæ, munitum. *Antennæ* longiores, posticæ. *Oculi* subprominuli.

Truncus cylindricus, leviter punctulatus, posticè lineolâ dorsali exaratus. *Scutellum* minutissimum. *Coleoptra* oblongo-ovata, viridescentia aut cærulea, ex pilositate obscura, striata: striis punctatis; interstitiis planiusculis.

That this is the *Curculio cyaneus* of De Geer, and *Attelabus æneus*, variety β, of Paykull, appears not only from their respective descriptions, but also from the circumstance of their finding it upon the thistle; (it is the only species I find upon that plant in this country) yet is it neither *Curculio cyaneus* of Linné, (for reasons before assigned) nor a variety of *Attelabus æneus* of Fabricius, for it is considerably smaller than the latter insect, and wants the remarkable furrow between the eyes which distinguishes it; its elytra also are of a different colour, with punctured

punctured striæ. The *Apion* Herbst has given for *Curculio Alliariæ* Linn., comes very near to this; but he describes the furrows of the elytra as not being punctured, which renders his synonym dubious.

56. APION RADIOLUS.

A. atrum glabrum, coleoptris ovatis acutis nigro-æneis, antennis posticis, rostro mediocri.

Curculio Radiolus. *Marsh. Ent. Brit.* i. 247. 25.

Long. Corp. $1\frac{2}{4}$ lin.

Habitat in Angliâ. Domina Hill. *Mus.* Dom. Marsham.

DESCR. CORPUS atrum, glabrum, radium textoris quodammodò referens.

CAPUT inter oculos rugulosum. *Rostrum* mediocre, modicè crassum. *Antennæ* posticæ.

TRUNCUS levissimè punctulatus. *Coleoptra* ovata, acuta, nigro-ænea, subsulcata: sulculis vix conspicuè punctatis; interstitiis convexiusculis.

57. APION OXURUM.

A. atrum, coleoptris ovatis acutis cæruleis viridescentibusve, antennis posticis, rostro mediocri.

Curculio aterrimus. *Marsh. Ent. Brit.* i. 244. 14!

Long. Corp. 2 lin.

Habitat in Angliæ *Malvis* frequens. *Mus.* nostr.

DESCR. CORPUS atrum, nitidum, pilositate parvâ rariùs adspersum.

CAPUT inter oculos ex punctis confluentibus rugulosum. *Rostrum* mediocre, nitidum, punctulatum, medio subattenuatum. *Antennæ* longiores, posticæ. *Oculi* subprominuli.

Truncus levissimè et creberrimè punctulatus, posticè lineolâ dorsali exaratus. *Scutellum* minutissimum. *Coleoptra* ovata, acuta, atro-cærulea, striata: striis subpunctatis; interstitiis convexiusculis.

Obs.—*Alter sexus variat corpore magìs piloso, capite punctulato, et inter oculos insuper obsoletè canaliculato, rostro subfiliformi punctulis admodùm conspicuis obscurato, et, postremò, elytris viridescentibus.*

Mr. Marsham entertained doubts, whether this was the *Curculio aterrimus* of Linné: in my opinion, that which I have described above from the Linnean cabinet possesses a stronger claim to be considered as the true one; but the description in *Fauna Suecica*, unless the original specimen had existed, is too general to decide the question. Linné says, however, *Elytra punctis striata*, which will scarcely agree with *Apion oxurum*, in which the punctures in the furrows of the elytra are not easily discoverable. The term *punctis striata*, taken in strictness, should signify that the elytra had no furrows, but merely punctures arranged in lines, a circumstance observable in no insect of this genus, that I have ever examined.

58. APION ÆNEUM.

A. atrum glabrum, coleoptris ovatis acutis æneis viridescente-cæruleisve, fronte canaliculatâ.

Herbst. Natursyst. vii. 101. 1. *t.* 102. *fig.* 1—A.

Attelabus æneus. *Fabr. Ent. Syst. Em.* i. b. 389. 23. *Syst. Eleuth.* ii. 423. 37. *Panz. Ent. Germ.* 296. 11. *Payk. Faun. Suec.* iii. 179. 14.

Curculio æneus. *Marsh. Ent. Brit.* i. 243. 13. *Gmel.* 1748. 132. *Vill. Ent. Eur.* i. 187. 41. iv. 267. *Payk. Mon. Curc.* 134.

Var. β.

Var. β.

Curculio chalceus. *Marsh. Ent. Brit.* i. 243. 12.
Attelabus cyaneus. *Panz. Faun. Germ. Init.* 20. *t.* 12.

Long. Corp. 2 lin.

Habitat in Angliæ *Malvis* et *Columniferis*. *Mus.* nostr.

DESCR. CORPUS atrum, glaberrimum, nitidiusculum.

CAPUT posticè lævissimum, inter oculos punctulatum, sulco intermedio profundiùs exaratum. *Rostrum* paulò brevius, crassiusculum, punctulatissimum, apud antennarum insertionem utrinque tumidulum. *Antennæ* paulò longiores, pone medium rostro insidentes. *Oculi* subprominuli.

TRUNCUS leniter et creberrimè punctulatus, anticè submarginatus, posticè lineolâ ante scutellum exaratus. *Scutellum* minutum. *Coleoptra* ovata, æneo nitidula, striata: striis impunctatis; interstitiis convexiusculis.

Var. β. Rostro breviori quam in α, thorace posticè puncto impresso nec lineolâ, elytris viridescente-cæruleis.

Mr. Marsham observes under his *Curculio æneus*, speaking of its resemblance to the preceding species (*Curculio chalceus*)—*An species distincta? An sexûs differentia?* When we consider that these are in almost every respect the counterparts of each other, even to the little channel drawn visibly between the eyes, differing scarcely in any thing except a slight variation in the colour of the elytra, we shall be inclined to adopt the latter opinion, especially when the following circumstance, that they feed together upon the same plants, is taken into consideration. Influenced by these reasons, I have given them as varieties. Variety β is evidently Panzer's *Attelabus cyaneus*, who took it upon *Alcea rosea*, a plant upon which it abounds, as well as on other

 Columniferæ,

Columniferæ, in our gardens. Had it the tubercles upon the thorax, I should consider it as the *Attelabus cyaneus* of Fabricius, to whose description in other respects it answers, and for the *habitat* of which he gives the mallow.

59. APION HÆMATODES.

A. rufum, oculis nigris, rostro brevissimo.

Curculio coccineus. *Mus. Lesk.* 18. 381? *Gmel.* 1742. 558?

Long. Corp. $1\frac{1}{4}$—$1\frac{1}{2}$ lin.

Habitat in Angliâ. In gramine sub *Ulice Europæo* semel plura inveni. *Mus.* nostr.

DESCR. CORPUS rufum, obscurum, pilis brevissimis, nisi sub lente vix conspicuis, rariùs consitum.

CAPUT thorace vix brevius, punctulatum. *Rostrum* brevissimum, (in hoc genere) crassiusculum, punctulatum, apice nitidum. *Antennæ* longiores, mediæ: clavâ majusculâ. *Oculi* nigri, prominuli.

TRUNCUS subcylindricus, leviter punctulatus, lineolâ aut puncto majori nullo. *Scutellum* minutissimum. *Coleoptra* oblongiuscula, striata: striis punctatis; interstitiis vix striis latioribus, convexis.

This species, which is noticed by Herbst as a variety of *Apion frumentarium*, appears nevertheless distinct from it, not only on account of differences of character, which I shall notice hereafter, but also from the different situations in which they are usually found; this, namely, upon the ground, and the other upon the dock: such is Herbst's remark from Hedwig, which is confirmed by my own observation, for I usually find *Apion hæmatodes* upon the earth; the other is common upon the dock in this neighbourhood, and Mr. Dillwyn finds it upon the same plant in Wales.

60. APION

60. APION FRUMENTARIUM.

A. sanguineum, oculis nigris, thorace subgloboso: posticè canaliculato.

Herbst. Natursyst. vii. 107. 6. *t.* 102. *f.* 6—F.

Curculio frumentarius. *Linn. Syst. Nat. Ed.* 12. 608. 15. *Faun. Suec.* 586. *Marsh. Ent. Brit.* i. 242. 11. *Gmel.* 1745. 15. *Vill. Ent. Eur.* i. 177. 12. *Act. Nidros.* iii. 391. 10. *Faun. Etrusc.* 301. *Helw.* 301. *Faun. Frid.* 10. 94. *Payk. Mon. Curc.* 130. *Act. Stockh.* 1750. 186. 1. *Lewenh. Arc.* 183. *Aug.* 6. *p.* 83. *f.* 1.

Curculio sanguineus. *De Geer.* v. 251. 40.

Attelabus frumentarius. *Fabr. Ent. Syst. Em.* i. b. 392. 35. *Syst. Eleuth.* ii. 427. 59. *Payk. Faun. Suec.* iii. 177. 10. *Faun. Ing.* 320. *Panz. Ent. Germ.* 298. 24. *Faun. Germ. Init.* 20. *t.* 14. *Walck. Faun. Paris.* i. 237. 15. *Latr. Hist. Nat. &c.* xi. 90.

Rhinomacer frumentarius. *Ent. Helv.* 109. 1. *t.* 13. *f.* 1, 2.

Long. Corp. 2¼ lin.

Habitat in Europâ frequens. In frumento diutiùs asservato pessimus. *Linn.* Imago in *Lapathis* passim obvia. *Mus.* nostr.

DESCR. CORPUS lætè sanguineum, ex pilositate quâdam parvâ obscurum.

Caput vix thorace brevius, punctulatum. *Rostrum* brevius, crassiusculum, basi punctulatum, apice læve nitidum. *Antennæ* longiores, pone medium rostri insertæ: clavæ articulis subdistinctis. *Oculi* nigri, prominuli.

Truncus subglobosus, anticè marginatus, punctulatissimus, posticè canaliculatus. *Scutellum* minutissimum. *Coleoptra* ex oblongo obovata, sulcata: sulculis punctatis; interstitiis convexis vix sulculis latioribus.

Var. β. ex sanguineo flavicans.

This insect, although very similar to the last, differs from it in some material characters. The colour is more of a blood

red;

red; the rostrum is longer in proportion; the thorax is of a different shape, channelled behind, with a margin next the head; the clava also of the antennæ is more distinctly jointed; besides this, it is three times as big as the other.

Fabricius, in his *Systema Eleutheratorum*, has placed *Curculio purpureus* of Linné in the synonymy of *Attelabus frumentarius*, regarding, I suspect, my *Apion frumentarium* as that insect, and *Apion hæmatodes* as the Linnean *Curculio frumentarius*, the former being of a much brighter colour than the latter: but neither of these will agree with the term by which Linné defines the rostrum of his *C. purpureus*—" *longissimum*," since both of them have a very short rostrum. What the true *C. purpureus* is, seems not now to be known: there is no specimen of it in the Linnean cabinet. Petiver's specimen was found in England, but it does not appear to have been taken since his time. According to Linné, *Apion frumentarium* is very destructive to the grain of wheat. I generally find it upon the common dock, which other entomologists have done both here and on the continent, as was observed under the preceding species. The larva and imago may perhaps live in different situations.

ADDENDUM.

After the Synopsis Specierum, and nearly the whole of this paper were printed, I met with the following fine nondescript species, which ought to follow *Apion affine*, *n.* 50.

61. APION LIMONII.

A. æneum, suprà purpurascente-cupreum, coleoptris obovatis, rostro crassiusculo. *Tab.* 1. *fig.* 20.

Long. Corp. 2 lin. γ. 1 lin.

Habitat in Angliæ *Statices Limonii* foliis. Apud-Holme-juxta

mare

mare in Norfolciâ Jul. ex. et Aug. in 1807. a nobis sæpiùs lectum. Apud Cley in eodem com. a Dom. J. Hooker in collibus arenosis maritimis. *Mus.* Dom. J. Hooker. Nostr.

DESCR. CORPUS pilis brevissimis decumbentibus, nisi sub lente vix conspicuis, consitum.

Caput longum satis, posticè læve cupreum, inter oculos punctatum: punctis confluentibus purpurascente-violaceum, subtùs æneum. *Rostrum* brevius, crassum, punctulatum, purpurascente-violaceum, subtùs atrum gibbum punctis excavatis utrinque notatum: disco lævi. *Antennæ* mediæ, longiores, nigræ. *Oculi* majusculi, subimmersi, nigri.

Truncus ferè cylindricus, cupreo nitidulus, leviter et discretè punctulatus, posticè foveolâ seu puncto magno excavato notatus. *Pectus* et *Epigastrium* æneo nitidula, punctata. *Pedes* reliquo corpore magìs pilosi, obscuriùs purpurascente-cuprei. *Coleoptra* ex globoso obovata, purpurascente-cupreo nitidula, striata: striis punctatis; interstitiis planiusculis.

Abdomen punctatum, obscurè purpurascente-cupreum: segmento primo æneo nitidulo.

Var. β. Trunco purpurascente-cupreo.

—— γ. Minus, totum cupreum: thorace canaliculato. An idem?

I met with this insect in the sea marshes at Holme-juxta-mare in Norfolk (a village remarkable for producing many scarce plants and insects) upon the leaves of *Statice Limonium*, when that plant was just beginning to blossom. Mr. J. Hooker took it upon the sand-hills at Cley in the same county. It is perfectly distinct from every other, and is by far the most beautiful and splendid species of the genus that I have yet seen.

Additional

ADDITIONAL OBSERVATION UPON APION NIGRITARSE, *n.* 18.

At Hunstanton, upon the Lynn Channel, I found this insect not very scarce upon the common dock, as well as upon the hazle-nut; and at Holme I met with it upon the bramble and hawthorn. These facts render its *habitat* very uncertain.

The rostrum of the other sex is entirely black.

REFERENCES TO THE FIGURES.

TAB. I.

Fig. 1.	Apion Ulicis,	*n.*	1
2.	—— Malvæ,	—	3
3.	—— vicinum,	—	8
4.	—— cærulescens,	—	10
5.	—— subulatum,	—	11
6.	—— nigritarse,	—	18
7.	—— pallipes,	—	20
8.	—— Fagi,	—	21
9.	—— punctifrons,	—	28
10.	—— striatum,	—	30
11.	—— ebeninum,	—	34
12.	—— Astragali,	—	35
13.	—— Spencii,	—	37
14.	—— atomarium,	—	40
15.	—— confluens,	—	44
16.	—— violaceum,	—	47
17.	—— Hydrolapathi,	—	48
18.	—— Hookeri,	—	52
19.	—— Carduorum,	—	55
20.	—— Limonii,	—	61

II. *Description*

W. K. delin.

II. *Description of several Marine Animals found on the South Coast of Devonshire. By George Montagu, Esq. F.L.S.*

Read June 18, 1805.

Since I last had the honour of addressing a paper to the Linnean Society on the subject of marine animals, much new matter has occurred in that department, and I trust the description of some of these, in addition to correct drawings, will enable those who may hereafter more immediately direct their attention to that study, to identify without doubt the objects in question.

Nothing can be in a greater state of confusion than many genera of the *Mollusca* order; and even those of the *Crustacea* are far from being clearly defined, although their structure greatly conduces to that end, by their unalterable form and durability. For these the cabinets of the curious may be occasionally consulted; but no museum can convey to the mind those distinguishing characters that form the divisions and specific distinctions of the former; their soft and delicate bodies can only be preserved in antiseptic fluids. In spirits, it is true, the mass is preserved, but the form is usually rendered shapeless, the colours vanish, and the membranaceous appendages, which constitute the principal divisional distinctions, are either entirely lost, or so contracted and distorted, that the greater part of the subjects of *Helminthology*, the more simple excepted, become a chaos of undistinguishable matter. The *Mollusca* must be described and figured from living specimens; and those of the

the marine division (which are by far the most numerous, and least known), in their own element*.

Favourable as our own country is for the study of marine animals, it is extraordinary that so little has been done in that branch of physiology since the writings of Ellis, who almost exclusively adopted the marine polype, and threw more than ordinary light on that obscure subject, both as to the habitations, or coralline substances, and the animals by which they were formed. But it is equally astonishing that this great naturalist should not have extended his researches further than to zoophites, who must in his various marine excursions, while contemplating the objects of his particular inquiry in their native element, have had under his eye an inconceivable variety of other animals, which so far surpass in beauty any of the coralline *Hydræ*, that our astonishment is excited at the total neglect of such unbounded animate beauty as is found to occasionally inhabit the various *Sertulariæ*, which could not but call forth wonder and admiration.

Possibly, however, this eminent philosopher, having in contemplation the completion of that abstruse department which he had adopted, did not choose to have his course diverted by that which an enthusiast seated on his hobby might term a minor object.

To our marine botanists many of the objects in question must also frequently occur, as some are by accident attached to *Algæ*, and others feed on particular *Fuci*. Such as are searching for, and deeply investigating the obscure fructification of these plants, may be capable of forming an idea of the very extra-

* The pelagic species, or those which inhabit the open sea, will quickly die in water less salt, taken at the mouths of rivers, or in estuaries communicating with fresh water.

ordinary

ordinary conformation and splendid colouring of many of the *Mollusca* animals that inhabit the deep; and these, though not their primary object, must arrest their attention, and be highly gratifying to an elevated mind.

To the few, therefore, who have the opportunity, by chance or choice, of examining these creatures in their native element, it is well known how little can be conveyed by even the most minute description, without well executed figures coloured from life; the want of which, added to the very concise descriptive information usually given, has thrown but very obscure light on the subject, even in the zoological works of the most celebrated naturalists: the divisions are undefined by evident and distinct characteristic marks; and, what is worse, obscurity becomes more clouded by the diversity of opinion as to arrangement, which frustrates the very intention of system, and serves only to reduce method again to chaos.

These considerations I must plead in excuse for the want of synonyms in some instances, perhaps, being prefixed to the subjects hereafter described.

As in my former paper, I have accompanied this with outlines only of the *Crustacea*, one or two figures excepted, where colouring was considered as essential.

The subjects given will be found to be mostly new; amongst the *Cancri*, however, two or three which are common, and which have unaccountably been confounded since the writings of Linnæus, are figured to elucidate their respective specific distinctions, and rescue from a state of confusion animals of very different habits.

If in those of the *Mollusca* I should have arranged any one that may not accord with the opinion of the helminthologist, I have to plead the indivisible connection of the links in the

amorphose subjects of this order, and the defective state of generic characters in the infantine progress of this abstruse science.

Should the Society consider these further discoveries of sufficient importance for public information through the medium of their Transactions, it will not fail to stimulate me to a continuance of my researches in this branch of zoology, which my situation affords; and which I shall have the pleasure of submitting from time to time for its opinion.

My object is, as far as possible to ascertain and identify what of the zoologic subjects hitherto described are British, especially in those departments which are the least cultivated, and in which so much remains to be done.

It has been doubted whether several species of the crabs described by Mr. Pennant be really distinct: as far as my own observation has gone, there appears no reason for such doubt, as almost the whole of those given in the British Zoology are in my cabinet, together with nearly an equal number of new species, or such as have never been noticed as indigenous to this country; and which remain to be added to the catalogue of British *Cancri*.

It may not be improper to remark in this place, that in order to show the legs of the crabs as distinctly as possible, those belonging to one side only have been delineated; the arms, however, of both sides have in general been given. In these, as well as in all the other subjects, the natural size is adverted to in the description, where such figures have been magnified; and where no such mention is made, the figure may be considered as representing the proper size.

CRUSTACEA.

CRUSTACEA.

Cancer floridus.

Tab. II. Fig. 1.

Cancer floridus. *Linn. Syst. p.* 1041. *Herbst.* ii. *t.* 21. *f.* 120.

Thorax smooth, indented and uneven; front slightly bilobate, sides quadridentate: antennæ minute: arms and hands very large, strong and rugged; fangs large, black, and bluntly toothed: legs short, having the extreme joint covered with a thick brown pile; claws small, brown: the tail is small and narrow, composed of five joints, of which the middle one is by much the largest, the end obtuse.

Length of the largest two inches; breadth two and a half.

Colour purplish-brown.

A variety is marked with two chesnut spots on the thorax, one behind the other, the first ovate, the second sub-rhomboidal.

The females are very inferior in size, and like the rest of this family may at once be known by their superior breadth of tail, which is formed of seven plates much ciliated with hair.

Not uncommon on some parts of the coast of Devon, under large stones, in rocky situations, at low water.

This species, I believe, has never been placed in the catalogue of British *Cancri*; but being now discovered to be indigenous to this island, it may be thought deserving a place amongst the literary communications of this country, notwithstanding it has been figured by Herbst.

This crab was once sent to me by a scientific friend as a Scotch production, with reference to the *C. corrugatus* of Pennant; to which, however, it has but little resemblance when compared*.

* *Cancer corrugatus* appears to be extremely rare; it has once or twice occurred, so that I can with certainty declare it to be not only distinct from this, but also from *C. velutinus*, with which it is most likely to be confounded.

I have

I have also been informed that it has been considered as the *C. orientalis, Herbst. tab.* 20. *fig.* 117; but if carefully compared with that figure, it will be found that the thorax is not in the least like, either in shape or markings, nor has that the dentated margin: whereas *Cancer floridus* of the same author corresponds in all those particulars. I cannot indeed quote Gmelin for this crab with any degree of certainty, as he refers to different species that are trilobated: it is however in all probability the *Cancer floridus* of Linnæus.

Cancer tumefactus.

Tab. II. Fig. 2.

Thorax sub-rhomboidal, smooth, with a slightly reflected margin, and three round tumid elevations placed triangularly: snout sub-bifid: antennæ extremely small: eyes small, hidden within their receptacles: arms short, sub-angulated, the edges uneven: hand short, the outer margin carinated; claws short, toothed, the thumb moderately hooked: legs eight, short, with subulate claws. The tail of the female is very broad, and covers the whole abdomen; the joints are obscure, but appear to be four, slightly ridged up the middle, with a depression on each side of the ridge.

Length three quarters of an inch; breadth rather more.

Colour pale dull yellow.

The very great similitude in contour between this and *Cancer tuberosus* of the British Zoology, might readily occasion their being confounded without comparison; indeed the laconic description given by Pennant for his *C. tuberosus* might have induced one to believe that it was intended for this, had not the figure bespoken the other. The material distinctions are, that this is smooth, of a much paler colour, and that the inequalities on the

thorax

thorax are globose; whereas the other has a longitudinal angulated ridge, intersected by a transverse one that forms a cross*: the legs and arms of this species are shorter, and the latter more uneven; the fangs shorter, and neither turned inwards nor angulated as in the other: the smooth reflexed margin of the thorax is also a strong character in this species.

Whether the *C. tuberosus* was originally taken at Weymouth is not mentioned; but Mr. Pennant took his description from one in the Portland cabinet. The *C. tumefactus* was taken at that place by Mr. Bryer, who kindly favoured me with it.

Cancer denticulatus.

Tab. II. Fig. 3.

Thorax broad before, narrow behind, rugged with spines and tubercles, the margin continued in one series of sub-serrated denticulations: the front between the eyes is quinquedentate, the middle spine the longest: the sides are also quinquedentate, besides a small process over each eye: eyes prominent: antennæ obscure: the arms not longer than the body, angulated, or ridged longitudinally, with blunt spines at the top of the middle joint; fangs angulated and denticulated; the legs are also angulated; claws subulate: tail narrow, regularly tapering.

Length three quarters of an inch; breadth rather more.

This singular species of crab was sent to me, amongst a variety of British *Cancri*, by my late worthy friend Mr. Boys, as the produce of the coast of Sandwich. The living colour could

* I have taken several specimens of *Cancer tuberosus* of both sexes, which differ in nothing but the size of the tail; and therefore these two crabs cannot be considered as possessing only sexual distinction.

not

not be ascertained, nor the length of the antennæ, the peduncles of which only remain.

I have since observed a specimen in the cabinet of Mr. Donovan, which, I am assured, came from the coast of Scotland.

Cancer Astacus subterraneus.

Tab. III. Fig. 1. 2.

Body long; thorax smooth, raised in the middle, surrounded by a sulcus; no proboscis, but two small, sub-pellucid, moveable, angulated plates in front that cover the base of the antennæ, through which are observed two contiguous, very minute spots, supposed to be the eyes fixed within the shell: antennæ four, pedunculated, inner pair bifid, scarcely longer than the thorax; the outer pair considerably superior in length, setaceous: the body consists of six smooth, glossy joints, spreading a little in the middle; caudal fins five, broad, with a midrib, and ciliated: one arm extremely large, smooth, and glossy, exceeding the size of the body, and nearly as long; the first joint very small, the second broader, and sloped off on the inner side to a sub-arcuated edge, which projects into a hooked process at the articulation with the first joint; the singular conformation of this part is calculated to receive the end of the next joint when folded, as represented by fig. 2: the two extreme joints are very broad, compressed, sub-marginated, and carinated; fangs large, the moveable one much hooked at the point, both destitute of teeth, except a few faint crenulæ scarcely discernible by the naked eye: the other arm is invariably small, with a plain chelate hand not of the same curious structure as the former: legs four pair, the first with a broad chelate foot; the third and fourth are somewhat similar to each other, being furnished with a simple flat

hirsute

hirsute claw; but the formation of the second pair is very singular; they are of a squarish shape, much compressed, and, at the ends, furnished with hair like a brush.

Length, independent of the arms, two inches.

Colour, when alive, more or less orange, sometimes yellow on the sides, and on the caudal fins; the arms usually pink.

This new and curious species of crab was discovered in digging for *Solen Vagina*, at the depth of nearly two feet beneath the surface, on a sand bank in the estuary of Kingsbridge. It is by no means plentiful; but a sufficient number has been taken, with much trouble, to learn that the large arm is not constant to one side, nor always so very disproportionate as in that from which the figure was taken.

The crustaceous covering of the body is very thin, and not far remote from membranaceous. The females, as in most of the *Cancer* tribe, more rarely occur: the ova of one taken were fixed under the tail, and of a red colour.

A new and singular species of *Oniscus* is found to inhabit the thoracic plate of this crab, and of which a figure and description are added to this paper.

Cancer Astacus stellatus.

Tab. III. Fig. 5.

Body long, composed of six smooth joints: thorax smooth behind, the anterior part roughened with minute spines disposed in longitudinal rows, and terminated by a very broad, serrated, trifid proboscis, the middle division of which is longest: antennæ four, pedunculated, the outer pair nearly as long as the body; inner pair short, bifid: eyes pedunculated, concealed under the proboscis: arms equal, of a moderate size; on the

the middle joint two or three small spines, and one on the joint nearest the body: hands sub-chelate, somewhat angulated by rows of tubercles beset with long hairs, armed with a slightly hooked moveable fang, and a hooked spine in place of a fixed one, not half so long as the fang, similar to that of *A. Crangon:* legs eight, very hirsute, furnished each with a single claw: caudal fins five, the fixed one sub-bifid, lateral ones with a midrib, and ciliated margin.

Length nearly two inches.

Colour yellowish-white, covered with minute stellated orange spots, as it appears under a lens, which give a predominance to the last.

This species, which, I am inclined to believe, is also a nondescript, was taken with the preceding: it is more rare, but appears, like that crab, to inhabit the subterraneous passages made by the *Solenes.*

Cancer Astacus multipes.

Tab. V. Fig. 3.

Cancer flexuosus. *Mull. Zool. Dan.* ii. *p.* 34. *t.* 66. *Prodr. p.* 196. *n.* 2352.

Body slender, incurvated, with seven joints: thorax smooth, destitute of proboscis: antennæ four, as long as the thorax, the middle pair bifid, the interior branch invariably dusky, the other white; exterior pair single, longest: anterior plates like those of the prawn, but more ciliated, the fringe pink, (Fig. 3. A.) eyes large, pedunculated: no visible arms: legs fourteen on each side, remarkably slender, and set in a double series: caudal fins five, the middle one bifid; lateral ones greatly ciliated on the interior margin with pink. (Fig. 3. B.)

At the termination of the thorax between the hinder legs is a

large

large tumid pouch in the female, composed of two broad diaphanous membranes that collapse. This abdominal pouch in the month of July was filled with minute embryo young, whose eyes, being nearly as large as their bodies, were visible through the membranous receptacle, and gave it a spotted appearance.

Length an inch and a quarter.

This is sometimes taken amongst prawns at Salcomb, and in the estuary of Kingsbridge; but never having seen any alive, I could not ascertain the colour. After passing through the operation of boiling by accident with the other species, it is of a pale colour, with some spots of dusky, particularly at the joints along the back. Both sexes are alike, except that the male is destitute of the receptacle on the abdomen.

By means of the accurate pencil of Mr. Henry Boys, who favoured me with drawings of many of the marine animals found at Sandwich, I have been able to identify this crab as an inhabitant also of the Kentish coast.

It appears to differ from the generality of this division of *Cancer* by the manner of carrying its young; and I suspect, if it be not viviparous like those of the division *Gammarus*, it retains its young for a considerable time after they are excluded; a circumstance unusual in the lobster tribe.

Cancer Astacus gibbosus.

Tab. V. Fig. 4.

Body slender, incurvated, with six joints: thorax smooth; proboscis long, laterally compressed, serrated; a small spine on each side the base of the proboscis, and another beneath each eye; antennæ four, upper pair shortest, bifid; lower pair single, nearly as long as the body: two anterior ciliated plates

as in the preceding species: eyes pedunculated: arms and legs scarcely definable, the anterior pair is terminated by a quadrifid joint, expressed at fig. 4. *a*; the second pair is cheleform, as at *b*; the other three pair appear, when magnified, to have a toothed claw, represented at *c*: besides these there are two very long and slender appendages, that do not strictly appear to be legs, but seem to be auxiliary to the palpi, though they originate so far from the mouth, for they are always placed forward towards the mouth; these are slightly chelate: the caudal fins are similar to those of the prawn, with a small spine near the end of the exterior pair, as at *d*.

What at once distinguishes this from the young prawn, or from any other, is the protuberant and curved formation of the third joint of the body, at which part the posterior end, or what is usually termed the tail, makes a short turn when doubled under the body.

The colour when alive is red.

Length rarely above an inch.

Not unfrequently taken by dredging at Torcross.

CANCER GAMMARUS LOCUSTA.

Tab. IV. Fig. 1.

Cancer Locusta. *Gmel. Syst. p.* 2992. *Turt. Linn.* iii. *p.* 760.
Oniscus Gammarellus. *Pallas Misc. Zool. t.* 14. *f.* 25. *Id. Spic. Zool.* 9. *t.* 4. *f.* 8.

Body smooth, glossy, compressed, with fourteen joints: antennæ four; the lower pair longest: eyes lunated, fixed*: arms

* Not pedunculated, or moveable, but fixed under the shell of the thorax; a circumstance common, I believe, to all this family.

four;

four; hands sub-cheleferous*, small, both pair furnished with a simple fang: legs ten, the four anterior small, the others much longer and larger, their thighs furnished with broad plates: the natatorial fins three pair, usually concealed under the tail: caudal fins properly five, subulate, bifid, the upper one longest; these are more or less serrated with small spines: on each of the three extreme joints of the body is a small fasciculus of spines.

Colour corneous, sometimes sub-rufous.

Length an inch.

This species is wholly marine, never quits the water by choice, is incapable of leaping, and seems to have very little use of its legs out of that element; for when deprived of water it lies on its side, and endeavours to force itself along by the action of the tail. If put into fresh water it soon dies. It is extremely common on all the coasts of Britain, but has been unaccountably confounded with several other species, some of which are greatly dissimilar, as I shall have occasion to notice hereafter.

That the *C. Pulex* and this should have been occasionally mistaken for each other would not have been so very extraordinary, had not their habits been so widely different, since it requires more than a cursory view to discriminate them; there are, however, essential specific distinctions independent of size and habits, which will be noticed in their place.

Cancer Gammarus Pulex.

Tab. IV. Fig. 2.

Cancer Pulex. *Gmel. Syst. p.* 1055. *Turt. Linn.* iii. *p.* 760. *Brit. Zool.* iv. *p.* 21. *No.* 33.

As this species is so nearly allied to *C. Locusta*, it is necessary

* A term adopted for a single fang capable of closing upon the hand, answering the purpose of a fixed claw, in contradistinction to cheleferous, or such as are formed with double claws.

only

only to point out the specific distinctions by which at all times it may readily be discriminated.

It never exceeds half an inch in length: the eyes are invariably ovate, not lunated: the three last joints of the body are constantly smooth; and the lower pair of caudal fins are rather the longest. Besides these essential characters of distinction, it is usually more hirsute about the legs than *C. Locusta*; the colour is paler, and most times tinged with green, especially about the antennæ.

The *C. Pulex* is as incapable of living in salt water as the *C. Locusta* is in fresh, although we have the authority of Linnæus and many of his disciples to the contrary. It is also incapable of leaping, and very soon dies when taken out of water.

The males of this as well as of the *C. Locusta* are superior in size to the other sex, which they embrace with their arms, and holding securely by fixing their claws in the joint of the thorax, swim about with them, not unfrequently on their back.

The females of both these species, as well as of most, if not all, of this family appear to be viviparous, and carry their young for some time after birth about the abdomen.

It is not impossible that *Cancer rubricatus*, tab. 5. fig. 1. may have also been confounded with these, though inferior in size, and different in colour and form of the antennæ, as will be more particularized in the description of that species.

Cancer Gammarus Saltator.

Tab. IV. Fig. 3.

Cancer Locusta. *Brit. Zool.* iv. *p.* 21. *No.* 34.
Oniscus Locusta. *Pallas Spic. Zool.* 9. *t.* 4. *f.* 7. *Misc. Zool. t.* 14. *f.* 15*.

Body oblong, sub-compressed, smooth, and extremely glossy,

consisting

consisting of twelve joints: antennæ four, the upper pair remarkably short; the lower extremely large, and equal in length to the body; the anterior half is composed of between thirty and forty approximate articulations roughened with short spines, especially on the interior sides; these are usually deflected beneath or along the sides of the body: eyes sub-triangular, reticulated, fixed: mouth placed beneath, much produced, and armed with formidable toothed forceps or jaws, similar to those of the genus *Locusta:* palpi very large: arms two, not much larger than the hinder legs, furnished with one serrated claw, as simple in structure as those on the legs, and not capable of folding upon the hand as in the two last species: the legs are twelve in number, the first pair immediately behind the arms are very small, and usually concealed under the plates of the body, so that they frequently pass unobserved; the three posterior pairs are very strong, the upper joint broad and flat; these, as well as the arms, are serrated and roughened with short spines: caudal fins two pair, serrated, and bifid, besides a pair of short appendages above, arising from the extremity of the last joint of the tail.

Length three quarters of an inch.

Colour when alive corneous; when dried it becomes paler, and by exposure to the sun gains a tinge of pink; and the antennæ partake of orange yellow. It is frequently found on the sea-shores, bleached white.

This is the species which is found in such vast abundance on all our sandy coasts, burrowing under the various rejectamenta of the sea, devouring both animal and vegetable matter with great avidity; and in its turn is the principal food of the ringed plover, and other shore birds. It is one of those insects whose service is most apparent in contributing to the dissolution of putrid matter.

The

The *C. Saltator* is without doubt the animal referred to by Pallas, and this confirms the opinion that Gmelin has confounded it with his *Cancer Locusta*, having quoted both the *Oniscus Gammarellus* and *O. Locusta* of that author for it. That it is Pennant's *C. Locusta* there can be little doubt, as he particularly mentions the quality of leaping, a power denied to the other species.

It may be suspected that the *C. Saltator* is amphibious, or perhaps only sub-aquatic, residing chiefly under the moist sand, about high water mark, or concealing itself beneath the various matter ejected by the sea, not only to feed, but to avoid the powerful rays of the sun. The most cursory observer cannot have passed unnoticed the multitudes which are seen skipping about in all directions upon our sandy beaches in a summer evening.

It appears very extraordinary that two insects so greatly dissimilar as this and the *C. Locusta* should have so long been confounded, for in neither habit nor manners do they in the least agree.

Whether the greater part of these commit themselves to the deep during the colder season has not been ascertained; but as it never has occurred to me at any time of the year in the water, I am inclined to believe they burrow deep under the sand, and occasionally come up, as some are to be met with at all seasons when the weather is temperate.

Cancer Gammarus littoreus.

Tab. IV. Fig. 4.

Pulex marinus. *Baster Op. Subs.* ii. *p.* 31. *t.* 3. *f.* 7. 8.

Body smooth, glossy, with twelve compressed joints: antennæ four, the upper pair very short; the lower pair half as long as the body, the anterior half composed of between twenty and thirty

thirty minute articulations: eyes fixed, sub-orbicular, sub-angulated: arms two, small; hands broad, flat, ovate, sub-chelefe-rous, sub-crenated in front; fang smooth, long, hooked, closing upon the crenated edge of the hand by the side of a blunt tooth: legs ten, the two anterior pairs slender, the others strong, and serrated with spines; the thighs laminated, the posterior pair remarkably large, and angulated in the last joint but one; the claws small: caudal fins slender, two pair jointed, bifid; above these a small, simple, bifid appendage.

Length nearly an inch.

Colour, when alive, yellowish-brown, turning afterwards to rufous.

This species, though not so frequent as the *C. Saltator*, is oftentimes found on our sandy shores, possessing much of the same habits as that insect, and like it is a leaper. Whether it remains on shore at all seasons is uncertain, but I suspect it is only sub-aquatic, never having taken it in the sea.

The *C. littoreus* is doubtless the species figured by Baster as above referred to, and which Gmelin has erroneously quoted for the Linnean *Cancer Pulex*. In the general appearance, as well as habits, it approaches *C. Saltator*, especially in its protruded jaws, though inferior in size: the antennæ are also less; but the most obvious distinguishing characters are the large subchelefe-rous hands, and angulated joints of the posterior pair of legs. The hands of *C. grossimanus* most resemble those of this species; but even in that particular there are minute distinctions, besides very material ones in other parts.

Cancer Gammarus grossimanus.

Tab. IV. Fig. 5.

Body very slender, compressed, smooth, with eleven joints: antennæ

antennæ four, the upper pair longest, but shorter than the body: eyes linear; arms four, subchelate, the fore pair very small; hands indented, hirsute; hinder pair large, ovate, compressed; fangs long and hooked, folding upon the edge of the hand, and partly received into a slight groove ciliated with hair: legs ten, the two anterior pairs small, the others much longer, with broad flat thighs: caudal fins five, bifid, the upper one longest.

Length about five lines.

Colour, when alive, pale-yellow, sometimes mottled with pink.

The anterior arms might be considered as palpi, but are much longer than those usually are; these, however, are generally so closely folded up as frequently, in dead specimens, to evade the eye.

Not uncommon on our rocky shores, in the pools left by the receding tide.

Although the hands of this and of *Cancer littoreus* are somewhat similar, yet there is a material distinction, especially in this being destitute of the knob or blunt spine. In the joint of the wrist and other parts the specific distinction is too obvious to require entering into detail, as a comparative view of the figures will evince.

CANCER GAMMARUS TALPA.

Tab. IV. Fig. 6.

Body with numerous joints slightly depressed: antennæ four, the outer pair longest, all tufted with hair at the end: eyes small, fixed, placed immediately behind the antennæ; beneath these is a small spine pointing forward: arms four, the anterior pair chelate; hands ovate; fangs plain and hooked: the second pair are of a very singular structure, the three last joints broad, flat, and pectinated on each side with long hooked spines, some-

what

what resembling the fore feet of a mole: legs ten, each furnished with a small subulate claw; the two posterior pairs appear to be natatorial, and are so extremely hirsute as to be almost concealed: the tail, or posterior part of the body, is also covered so closely with hair as to render the extreme joints indistinct; at the extremity are two long setiform appendages tufted with hair, which are capable of closing together instantaneously.

Length of the body about four lines.

Colour yellowish-white: the hair and divisions between the joints partake most of the former.

This very curious species of *Cancer* was first discovered on the large scallop, *Pecten maximus*, from Salcomb, but appears extremely rare.

Cancer Gammarus rubricatus.

Tab. V. Fig. 1.

Body slender, compressed, with twelve smooth joints: antennæ four, the lower pair shortest, the upper nearly as long as the body: eyes crimson, reticulated, sub-angulated, and rather protruded forward between the upper and lower antennæ: arms four, similar; hands small, oblong, and sub-cheleferous; fangs hooked: legs ten, the two anterior pairs short, the others considerably larger, all beset with bristles, especially at the joints: caudal fins two pairs, the last joint bifid; above these, two very short appendages.

Length half an inch.

Colour usually reddish, or pale pink, minutely and closely speckled with a darker shade of the same.

This species, which is not common, approaches much nearer to *Cancer Pulex* than any other: independent, however, of its

being smaller, more slender, and differing in colour and habits, it may readily be distinguished from it by the superior antennæ being the longest; and from *C. Locusta* by the same mark, and by the short upper caudal fins or appendages, as well as by being destitute of the spines on the last joints of the tail.

CANCER GAMMARUS FALCATUS.

Tab. V. Fig. 2.

Body slender, with twelve smooth compressed joints nearly destitute of gloss: antennæ four, ciliated with hair beneath; the lower pair extremely large, and nearly as long as the body: eyes small: arms four; hands of the hinder pair very large, oblong, and sub-chelate, furnished with two spines on the inner edge; fangs falciform, with one tooth; the fore pair of arms and hands extremely small, scarcely visible by a common pocket lens, and might be considered as palpi, were it not for their situation: legs ten, hirsute, the two anterior pairs very short, slender, and usually drawn up and concealed by the plates of the body: the other legs moderately large; thighs broad and flat: caudal fins three pairs, subulate.

Length five lines.

Colour crimson, or mottled with a mixture of white; antennæ marked the same.

This curious and rare species inhabits the deep, amongst *Sertularia*, and *Algæ*, and has only been taken by dredging at Torcross.

PHALANGIUM SPINOSUM.

Tab. V. Fig. 7.

Body linear: snout long cylindric deflected: no feelers: eyes four, fixed in a conical tubercle on the top of the fore part of the body

body behind the snout, placed two forward, two backward, and appear under a microscope strongly reticulated; the tubercle on which they are seated, verrucose: on the back between the hinder pair of legs is an erect cylindric tubercle, which in some point of view might be mistaken for a tail; the summit of this is furnished with two minute spines: legs long, slender, spinous.

The tubercle, with the eyes, is represented at fig. 7. a.; the foot at b.

Length of the body a quarter of an inch.

Colour rufous-brown.

The female is furnished with a pair of long jointed appendages, which originate at the fore part of the thorax, and turn underneath, as described by the figure.

The use of these antennæ-like members is for holding and carrying about their eggs. This sexual distinction in most, if not in all, of the marine species of *Phalangium* does not appear to have been noticed as such; and for want of this knowledge the same species have been differently described. These female appendages are very conspicuous both in *Phalangium Balænarum* and *Grossipes*, and are frequently found holding a quantity of eggs agglutinated to each.

This might have been referred to *P. hirtum* of Turton, but the want of the four palpi prevents it from being placed in his division of *Nymphion*.

PHALANGIUM ACULEATUM.

Tab. V. Fig. 8.

Phalangium spinipes. *Gmel. Syst. p.* 2942. 16? *Fabr. Fn. Gröenl. p.* 232. *No.* 211? *Turt. Linn.* iii. *p.* 715?

Body linear, with four joints like the last: snout cylindric, tubular,

tubular, deflected: feelers four, the upper pair chelate; the lower pair minute, and hid beneath: eyes four, seated on a conic tubercle differing in shape from that of *P. spinosum*, Fig. 8. c. On the posterior part of the back is an erect tubercle similar to that on the last species; but the legs are longer in proportion, furnished with slender spines or bristles at the joints.

Less than the preceding.

Colour dusky black.

Possibly this is the Gmelinian *P. spinipes:* if so, we are informed that it is found in the Norwegian Sea. It is not of frequent occurrence on our coasts, but sufficient to know that the female is possessed of the filiform receptacles for the ova.

Doctor Turton has given a species of *Phalangium* under the title of *hirtum*, without reference or synonyma, that appears only to differ from *P. spinipes* in being hairy instead of spinous, and is probably the same; for the distinction between hair, bristles, and slender spines, on the limbs of these small animals, is so extremely vague, that a more minute definition of such subjects is required to truly enlighten the more abstruse parts of natural history.

Oniscus Testudo.

Tab. V. Fig. 5.

Body sub-ovate, composed of eight joints rising to a ridge on the back; the plates elevated at their edges; the four first fall very low on the sides, and obscure the anterior legs: along each side of the body a row of small tubercles: the front sub-bifid: antennæ four, very short, lower pair hid beneath: eyes prominent, black: posterior end obtusely pointed; caudal fins beneath, obscure: legs fourteen, short and trong, the three posterior pairs longest; all furnished with a simple claw.

Length

Length two lines.

Colour dull red, with a white spot on the anterior part of the back, but as the insect dies this mark is lost. Rare.

Oniscus gracilis.

Tab. V. Fig. 6.

Body long, slender, sub-compressed, sub-cylindric, with eight joints terminated by five large caudal appendages truncated at their ends; these are deflected nearly at right angles with the body, the middle one fixed; lateral ones jointed, and spread a little upwards in a semicircular form: antennæ four, short: legs fourteen, the anterior pair large, with broad feet, and slightly hooked claws; the rest short and slender.

Length five lines.

Colour pale, clouded with rufous. Rare.

Oniscus thoracicus.

Tab. III. Fig. 3. 4.

Body ovate, inequilateral, with about fifteen indistinct joints indented at the sides, the six posterior shooting into long lateral fasciculate, fleshy, ramous appendages, and the extremity furnished with six simple recurved ones, two of which are larger than the rest: antennæ four, short, the outer pair longest, and only visible above: the two first joints of the body furnished with a long flat, oar-like, fleshy fin or cirrus on each side; the other joints with similar short ones: legs fourteen, very short, crooked, and concealed beneath: the abdominal valves are large, cover the whole under part of the body, and form a receptacle for the ova, which, in the specimens before me, is vastly distended with many thousands of a pale orange colour.

Length,

Length, including the posterior appendages, scarcely half an inch.

Colour usually orange; lateral appendages whitish.

The male is very inferior in size, of a more slender form, and destitute of the cirri on the anterior part of the body; and those on the posterior joints are simple, not branched as in the female: in other respects they agree.

This curious species of *Oniscus* inhabits the thoracic plate of *Cancer subterraneus*, (Tab. III. fig. 1.) concealing itself between the fleshy part and the shell, and forming a tumour on one side. From this situation I have extracted it alive, and have kept it in that state for several days in a glass of sea water. In the few of that rare species of crab I have obtained, two or three of these parasitical insects have occurred, and have always been attended by the male, who attaches himself firmly by his claws to the ventral fins, or appendages.

As this insect seems to be possessed of little or no locomotive power, it is probable the greater part of the eggs or young must perish; for it must be in one of these states that it finds its way under the thoracic shell of the crab, and there receives that nourishment which in all probability is the only means of its existence.

The very disproportionate size of the sexes is wisely adapted to an animal whose habitation is so confined.

Oniscus Squillarum.

This is another parasitical species, inhabiting the same part of the prawn or pandle as the last is found to do in *Cancer subterraneus.*

The

The body is inequilaterally ovate*, composed of thirteen flat joints, the articulations forming as many scallops on the sides: antennæ and eyes obscure: legs fourteen, very short, crooked, and usually folded up and concealed under the seven first, or anterior scallops on each side: the under part of the body between the legs is covered with broad membranes that collapse and form a receptacle for the eggs, which are extremely small and numerous.

Length rarely half an inch.

Colour pale greenish, and glossy above; the abdominal membranes dark at their edges.

The most incurious cannot but have noticed the tumour so common on the thorax of the prawn or shrimp during the summer months, that is occasioned by the lodgement of this animal, whose growth occasions the distortion of the shell. This tumour forms a secure asylum for the protection of the more than usually soft and membranaceous bodies of these parasitical *Onisci*.

That an insect so extremely common, and obvious to the most cursory observer, should not have found a place in the *Systema Naturæ* appears very extraordinary; and I have been induced to describe it, because it seems to have been omitted by even the more modern systematists; or is certainly misplaced, and not where it ought to be.

The male, which has hitherto escaped observation, is probably very minute, as in the preceding species.

* The dissimilarity in the sides of these insects is occasioned by the unequal pressure they receive from the thoracic shell of the crab; this inequilateral growth is therefore not constantly alike, but depends on the side of the thorax each individual inhabits.

MOLLUSCA.

Bulla Hydatis.

Tab. VI. Fig. 1.

Animal not referable to any class in the *Systema Naturæ*.

Test. Brit. p. 217. *Vig.* 1. *fig.* 2.

In the *Testacea Britannica* the animal is described from a dead specimen; and the figure referred to only represents the receded state of the animal previous to dissolution.

Recent opportunity of examining many of the living animals of an unusually large size affords the means of correcting the mistake in describing it as being destitute of eyes: and I trust a figure taken from one in a lively and extended state will not be unacceptable, more especially as it is of singular appearance and beauty.

When the animal is in motion, two black eyes on the top of the head are visible without the aid of a glass; these are sunk in small white depressions, remote from each other, but somewhat central in the shield that covers the whole anterior part: the sustentaculum is very large, extending behind, and on the sides, into broad finlike membranes that reflect, and almost conceal the shell; the two lateral ones turn under the shield at their anterior edges: the posterior membrane is divided from the others; the right side of this is spread on the place where it is crawling, and the left side takes a turn round the posterior end of the shell, and reflects over it. When the edges of the shield are thrown up, and open to view the space between that and the sustentaculum, on each side is observed a yellow marking in elegant ramifications like a feather, but not apparently detached as in the animal of *Bulla plumula**.

* *Test. Brit. Vig.* 2. *fig.* 5.

The

The animal when fully extended is nearly double the length of the shell: length of the specimen figured, two inches and a half; of the shell, one and a quarter.

The colour is a mixture of purplish-brown, cinereous and orange, disposed in minute confluent specks, darkest on the lateral fins.

Doris longicornis.

Tab. VII. Fig. 1.

Body long, slender; posterior end acuminated; head rounded in front: tentacula four, of which the first pair are very long, setiform, and extend forward; the other pair are remote, short, and erect: eyes two, small and black, situated at the base of the hindmost tentacula: on the right side, near the eyes, is a cluster of short cirri; and at a little distance from these commence four series of longer ones, of a pink colour, spotted with white, standing transversely, and extending down the sides; these cover the middle of the animal; the other parts are yellowish-white, tinged with pink about the eyes.

Length half an inch.

Doris nodosa.

Tab. VII. Fig. 2.

Body obovate, convex above, surrounded by a broad membranaceous margin: tentacula two, short, with perfoliated tips, and retractile, within depressed receptacles: on each side the back are four equidistant nodules or papillæ: at the posterior end of the back are nine or ten ramous appendages: the sustentaculum is broad, bilobated in front, and acuminated be-

 hind:

hind: from this part the membranaceous margin of the body is detached.

Length half an inch.

Colour white, with a tinge of pink on the back.

Both this and the preceding species have but rarely occurred, and may prove to be entirely new; at least I am unable to refer to any figure or description of them.

APHRODITA CLAVA.

Tab. VII. Fig. 3.

Aphrodita squamata. *Gmel. Syst. p.* 3108? *Brit. Zool. t.* 23. *f.* 26?

Aphrodita punctata. *Mull. Zool. Dan.* iii. *p.* 25. *t.* 96. *f.* 1. *Prodr. p.* 218. *n.* 2642?

Body with about twenty-four joints, and as many peduncles and fasciculate feet on each side; the bristles yellow: squamæ twelve or thirteen pair, of an ochraceous-yellow, mottled, and speckled with purplish brown, palest at their anterior margin; these usually divide down the middle of the back, but in this particular the animals of this class are variable, as much depends on the state of extension or contraction: along each side is a row of clavated cirri, with a slender appendage at their tips, and just below the club, marked with a brown band; these surround the animal, and might at the anterior end be mistaken for tentacula; the lateral ones originate between the scales.

Length an inch and a half.

Of the various species of *Aphrodita* which have hitherto come under inspection, this appears to be the nearest allied to *A. squamata;* but as the greater part of them chiefly differ in less obvious particulars than in general appearance, they require more minute

minute description in order to ascertain the different species with any degree of precision. In most instances where they possess conspicuous lateral cirri, their shape will be found greatly to assist in discrimination.

Our reference to Gmelin for this species, it must be confessed, is not without very considerable doubt, especially as he has quoted a figure in Baster not in the smallest degree like, nor is it even of this genus. But possibly our species may be the same as that described by Pennant.

AMPHITRITE INFUNDIBULUM.

Tab. VIII.

Body long; joints numerous, distant, of an orange colour annulated with whitish: fasciculi very small; branchiæ obscure: at the base of the tentacula a scalloped membrane: tentacula two, semicircular when spread, and nearly uniting into a regular circle; these are each composed of about thirty-seven rays, connected by a transparent web, except at the points, which turn a little inwards; the outside of these singularly beautiful arms is smooth, and of a purple colour, darkest at the tips of the rays; the inside is most elegantly ciliated with two rows of fimbriæ along each ray, of a chesnut colour shaded to a purple near the centre: mouth purple, the lips bordered with chesnut.

This animal is capable of the most sudden contraction, from eight or ten inches in length, to three or four; it has between a hundred and fifty and a hundred and sixty joints, becoming very small at the posterior end.

The case or tube formed by this species of *Amphitrite* is wholly gelatinous, of a very firm and elastic nature, greenish on the outside, but usually stained black by the soil they inhabit. These cases are composed of many layers or strata, and

when the first coat is removed, the remaining part is quite hyaline, and the animal nearly as distinctly seen as through glass.

This new and interesting species I discovered in the estuary of Kingsbridge, near the Salt stone, but not common, and only uncovered at the lowest ebb of spring tides. The case is buried beneath the surface, and is only discoverable by a small portion above, appearing like a piece of black jelly. When the tide returns, the animal displays its beautiful tentacula, but rarely exposes its body. Confined in a glass of sea water, it sickens in a few days; and if not changed, evacuates its tube and dies.

In its native abode it recedes on the least alarm, and when the gelatinous case is taken in the hand, and the animal is extended within it, the sudden contraction within the tremulous tube produces a singular, and instantaneous, vibrative shock to the parts in contact, that, being unexpected, creates surprise.

The essential character of this species is the connected fibres of the tentacula, in which it differs from all others hitherto described.

TEREBELLA TENTACULATA.

Tab. VI. Fig. 2.

Body long and slender, composed of more than two hundred annulations, each furnished with two fasciculi of very minute bristles: no eyes: branchiæ obscure: from the sides issue very long, red, capillary appendages, most numerous near the anterior end, but the point, or snout, is destitute of them, and becomes more acuminated; the mouth is placed beneath: the posterior end is also obtusely pointed.

Length eight or nine inches.

The colour of the upper part is olive-green, the under part dull orange.

The lateral filiform appendages are continually in motion, appearing

pearing like slender red worms contorting in all directions round the animal; after death these usually curl up, when they first become orange, and in a little time wholly lose their colour.

This curious species of vermes was taken from a piece of timber that had been perfoliated by *pholades*, and was destitute of any natural covering.

It is extremely difficult, in the present state of our imperfect knowledge of the marine *Mollusca*, to class many of them by the characters prescribed by even the more modern authors. That the difference in opinion as to the arrangement of such amorphose animals whose connecting links are so extremely similar, and appearance so variable, will scarcely ever admit of their being brought within the reasonable bounds of generic distinction, must be obvious to those who have attended more closely to the subject of helminthology: the best authors seem to confirm this opinion by their discordant arrangement.

It may be doubted whether the animal in question be nearest allied to the *Terebella* or *Nereis*, or even whether it strictly belong to either.

Nereis pinnigera.
Tab. VI. Fig. 3.

Body long and slender, with numerous opaque white joints transversely marked with yellow, and furnished at the sides with long flat appendages that flow over the back: tentacula scarcely distinguishable, unless the longer appendages in front be such: eyes four, chocolate colour: the posterior end suddenly decreases, and becomes very small, as if that part had been newly formed; a circumstance of no unreasonable conjecture, as it is well known that many of the *Mollusca* tribe are capable of reproduction.

Length an inch and a half.

Holothuria Pentactes, var.

Tab. VII. Fig. 4.

Cylindric, white, covered with a mottled film or epidermis that seems to obscure the real colour: along the body are five rows of papillæ disposed in double series, that at times give it a sub-pentangular form; but shape is a vague character in many of these animals, as in this some parts are often inflated, while others are contracted. The anterior end, for an inch or more, is of a purplish-brown, and furnished with eight large, and two very small contiguous, elegantly ramous tentacula of a purple and yellow colour; the tips of all the smaller ramifications are of the latter. When the animal was alive it was observable that one of the least arms, or tentacula, was always covering the mouth, and for that purpose were alternately in motion: the space within the arms is purple; the lips or margin of the aperture white: the posterior end is furnished with a small pentangular opening of a red colour, through which the water was observed to be taken in, as well as ejected.

Length, when fully extended, six inches; diameter half an inch.

It is probably an inhabitant of the deep, as it was found on the sands at Milton, after a storm. When put into a glass of sea water it showed no signs of life for a considerable time, but was contracted, so that the tentacula, and all the anterior end coloured with purple, were drawn in and obscured.

This species of *Holothuria* bears more affinity to *H. Pentactes* than to any other; yet after a careful examination of the various figures given by several authors, some doubts remain on the subject.

Lucernaria Auricula.

Tab. VII. Fig. 5.

Lucernaria Auricula. *Gmel. Syst. p.* 3151.
Holothuria lagenam referens, tentaculis octonis fasciculatis. *Mull. Prodr. Zool. Dan.* 2812.

Pellucid, green, brown, purple, red, or yellow, and all the intermediate shades in different subjects: peduncle short, cylindric, sub-angular: arms usually eight surrounding the mouth, connected by a thin membrane almost to the top, the apex of each furnished with numerous short clavate appendages; between each arm on the margin of the web is a small oval reflected vesicle.

Length three quarters of an inch; expansion of the arms full as much.

The arms of these animals are in continual motion, catching their prey, and carrying it to their mouths.

Of the three known species of *Lucernaria*, this is the only one which has occurred on our coasts, and that not frequent; several, however, were taken together in Salcomb Bay, at an unusually low tide, adhering to algæ.

The figure represents a variety with only seven arms.

REFERENCES TO THE FIGURES.

Tab. II. *Fig.* 1. Cancer floridus.
2. ——— tumefactus.
3. ——— denticulatus.
Tab. III. *Fig.* 1. 2. ——— subterraneus.
3. 4. Oniscus thoracicus.
5. Cancer stellatus.

Tab. IV.

Tab. IV. *Fig.*	1.	Cancer Locusta.
	2.	—— Pulex.
	3.	—— Saltator.
	4.	—— littoreus.
	5.	—— grossimanus.
	6.	—— Talpa.
Tab. V. *Fig.*	1.	—— rubricatus.
	2.	—— falcatus.
	3.	—— multipes.
	4.	—— gibbosus.
	5.	Oniscus Testudo.
	6.	—— gracilis.
	7.	Phalangium spinosum.
	8.	—— aculeatum.
Tab. VI. *Fig.*	1.	Bulla Hydatis.
	2.	Terebella tentaculata.
	3.	Nereis pinnigera.
Tab. VII. *Fig.*	1.	Doris longicornis.
	2.	—— nodosa.
	3.	Aphrodita Clava.
	4.	Holothuria Pentactes, var.
	5.	Lucernaria Auricula.
Tab. VIII.		Amphitrite Infundibulum.

III. *An*

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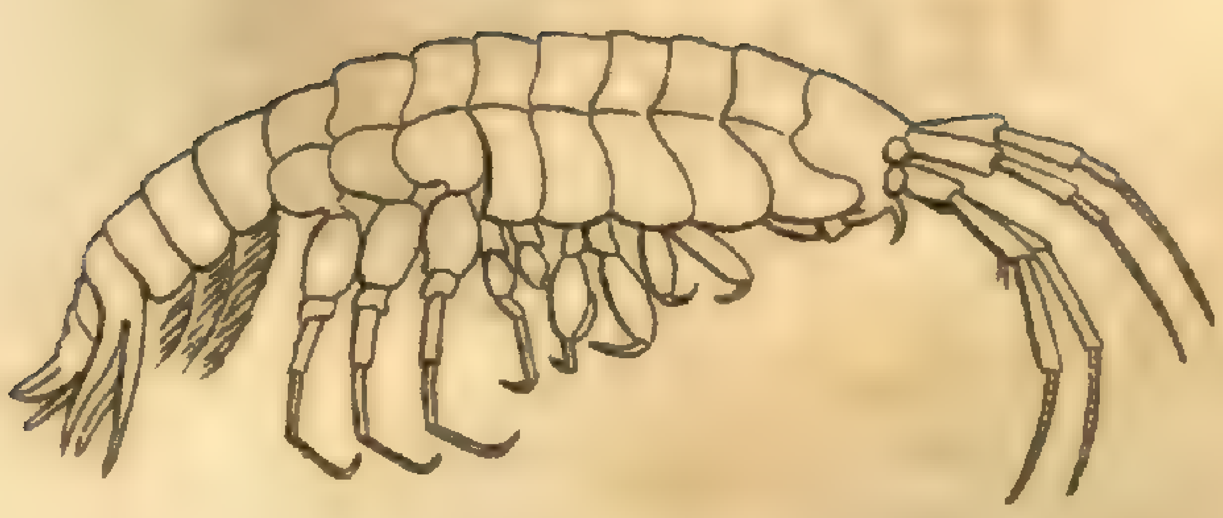

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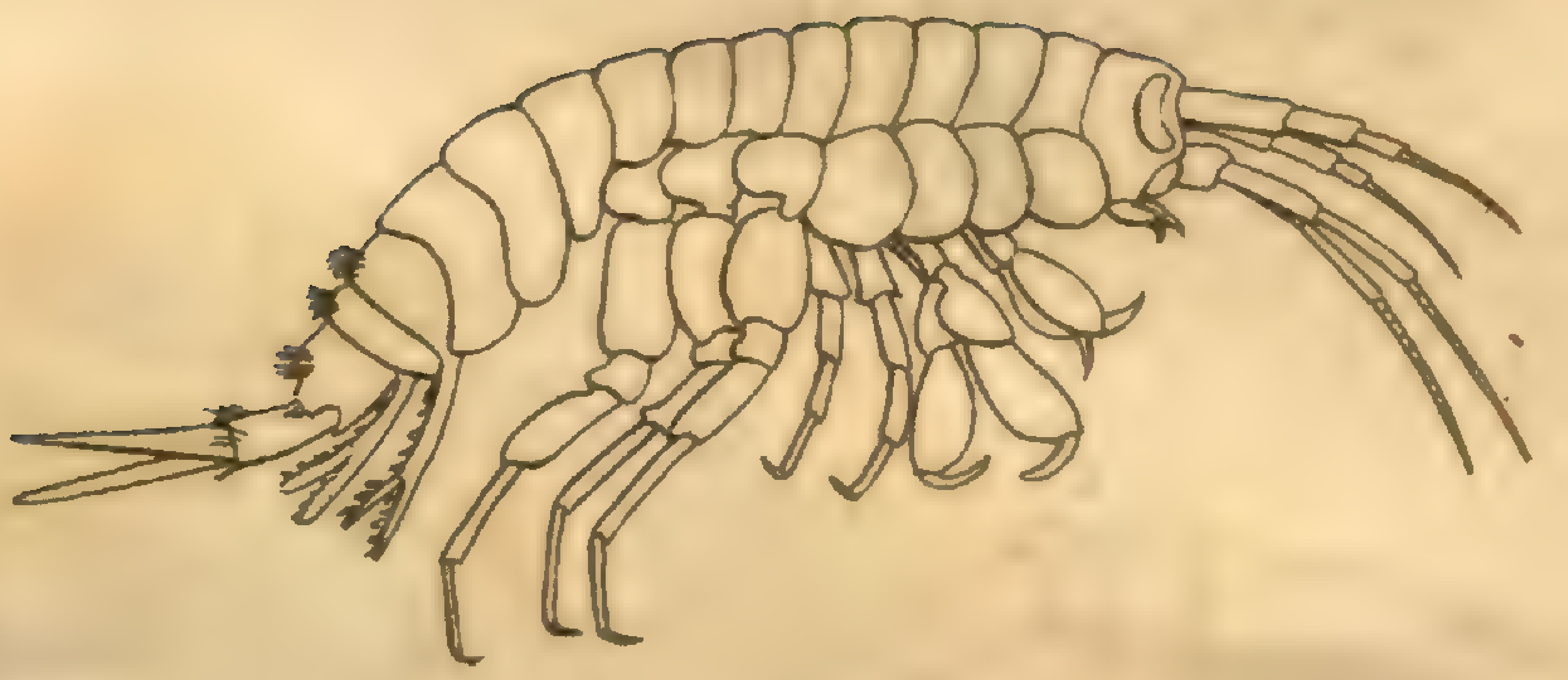

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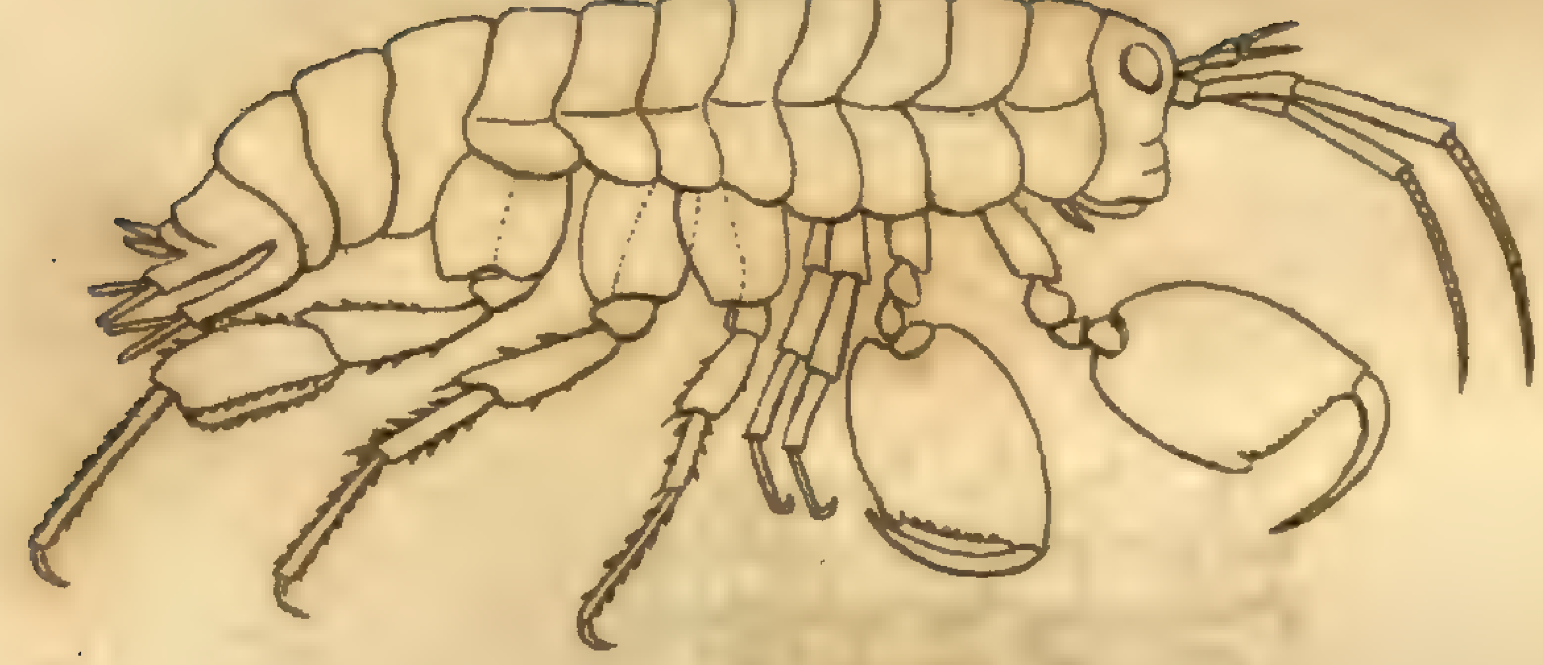

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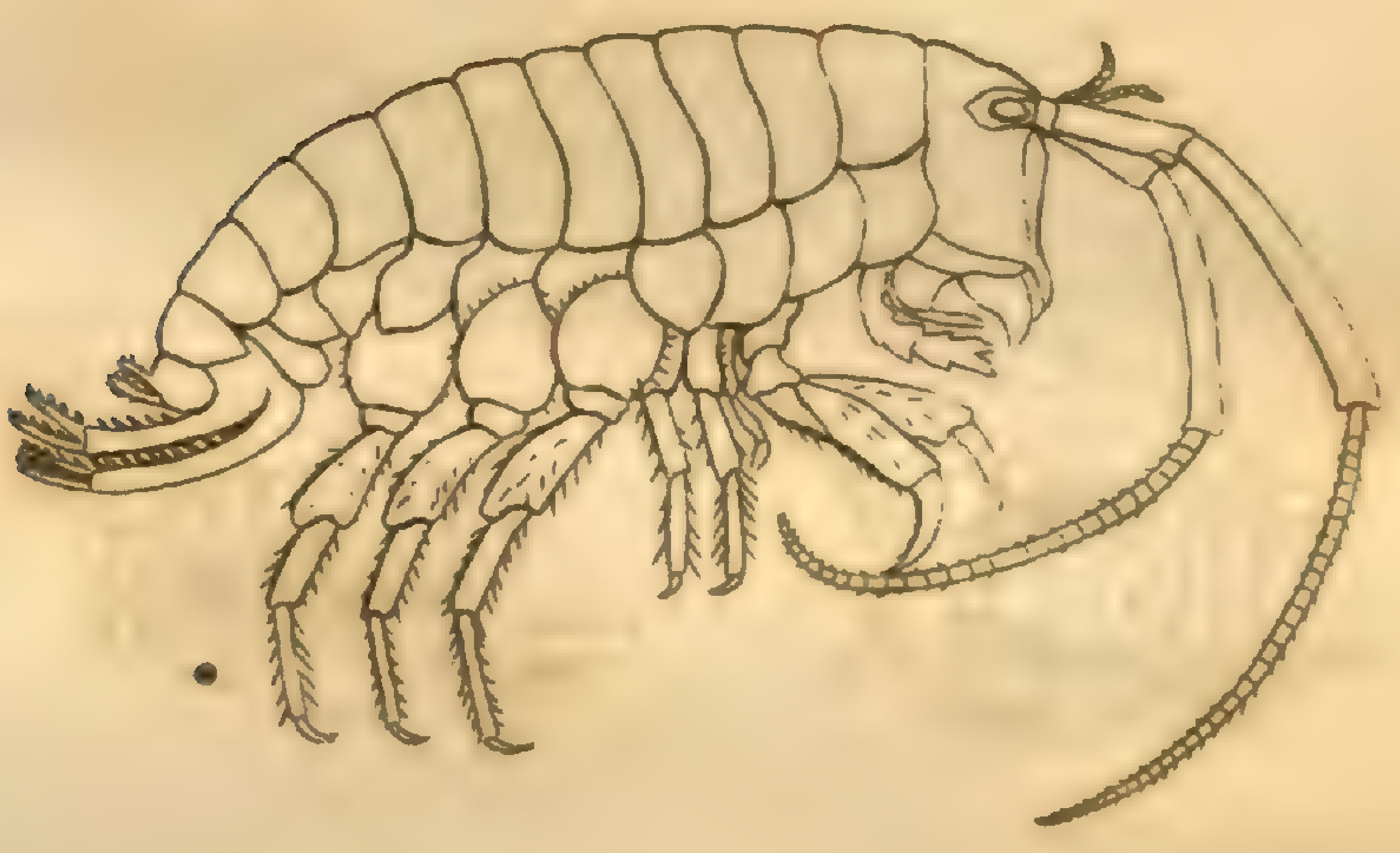

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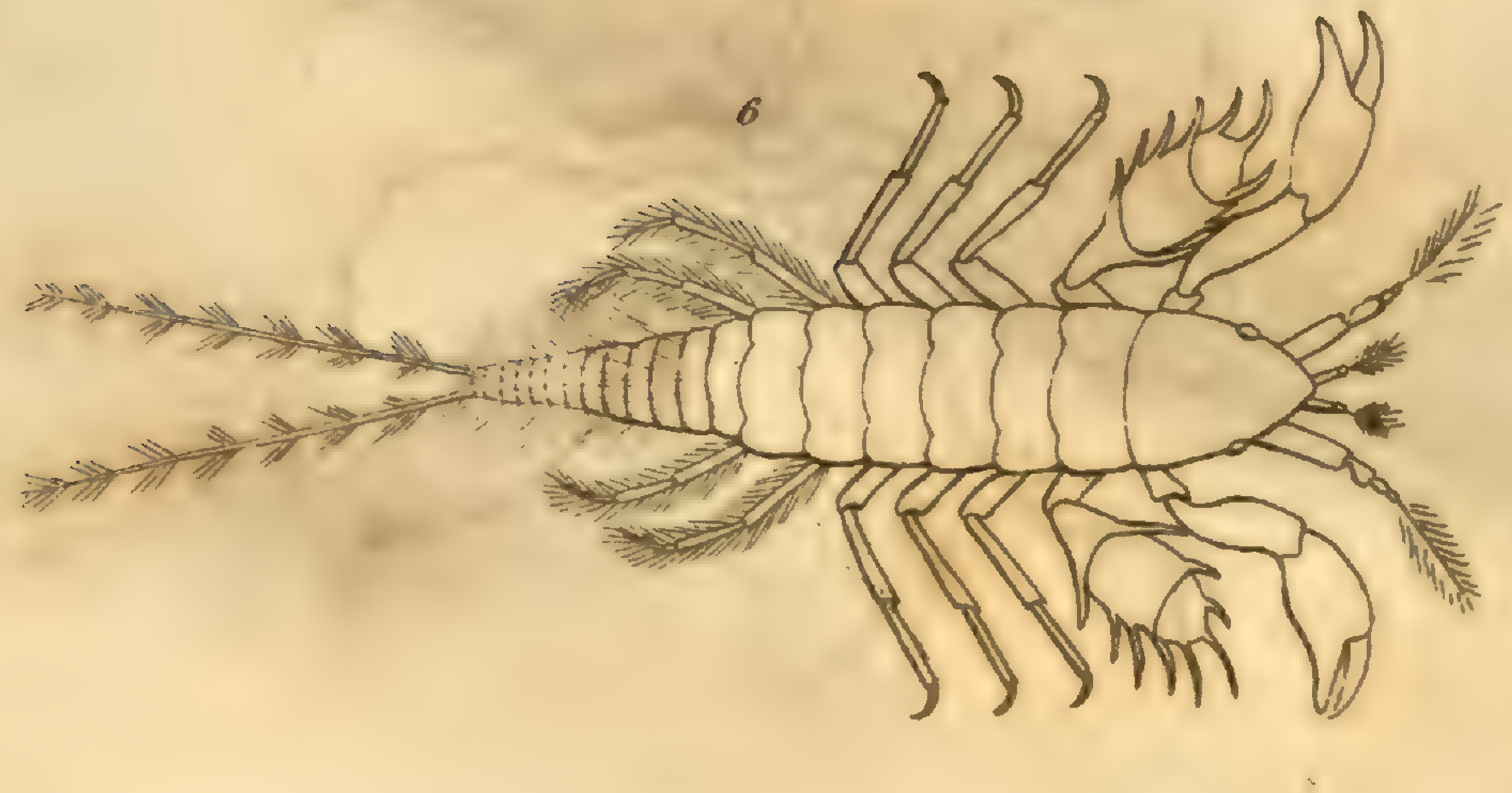

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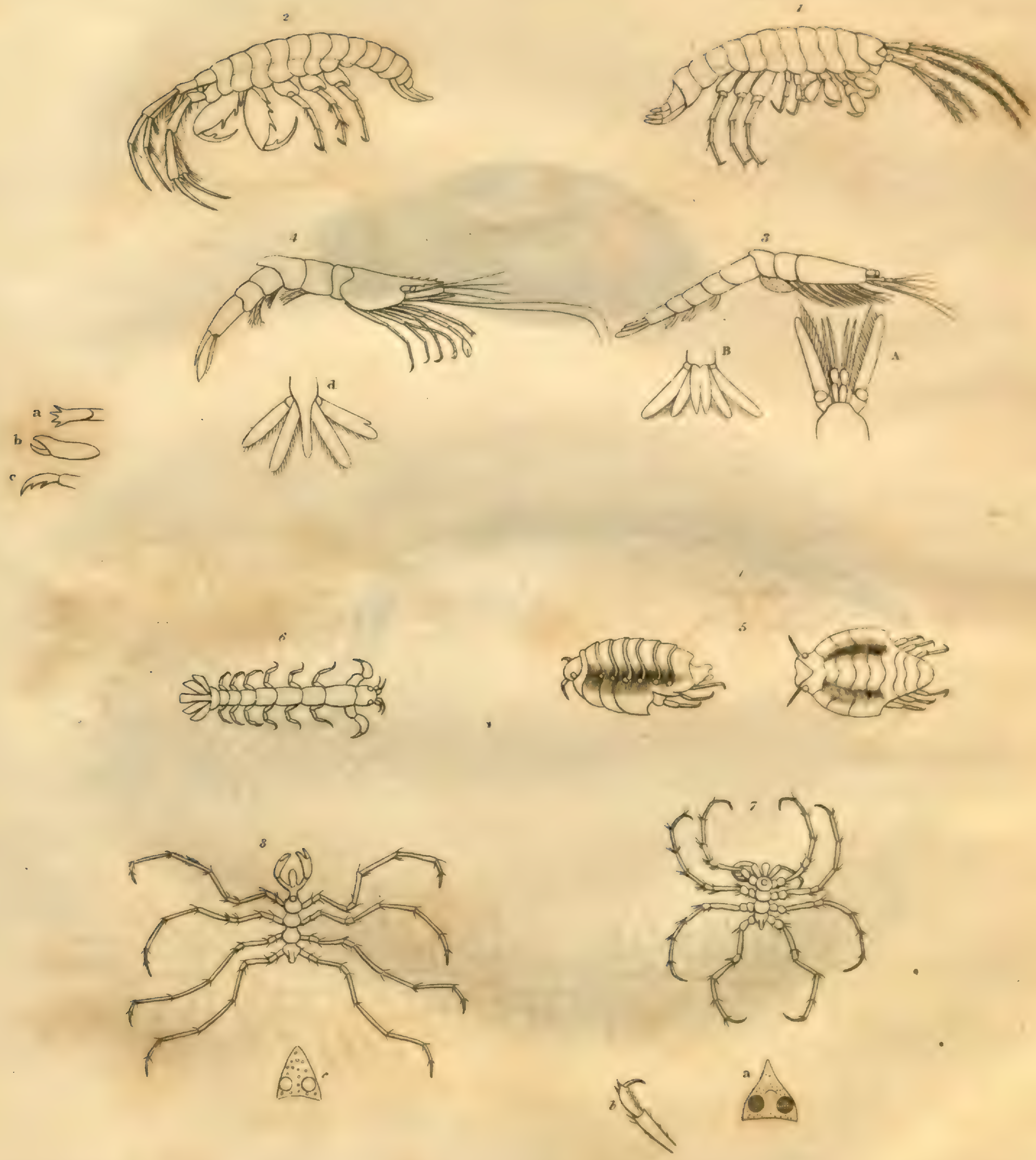
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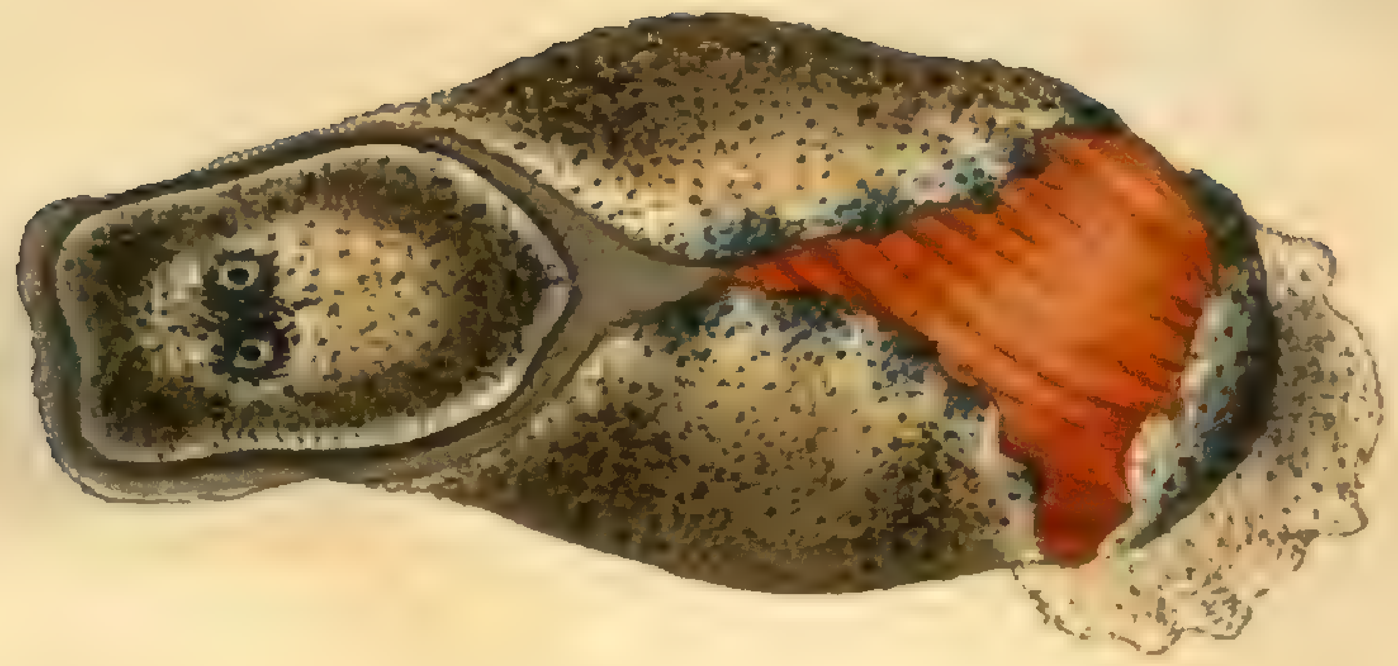

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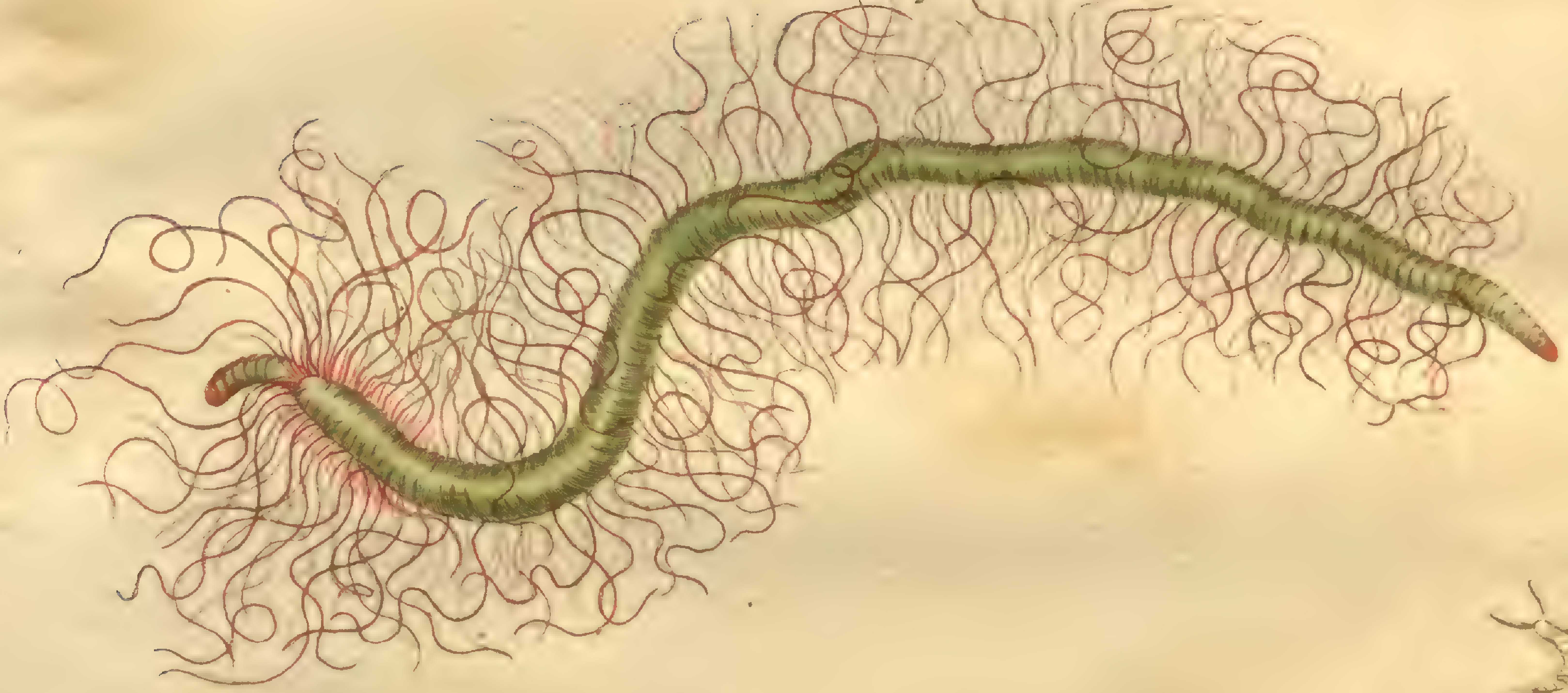

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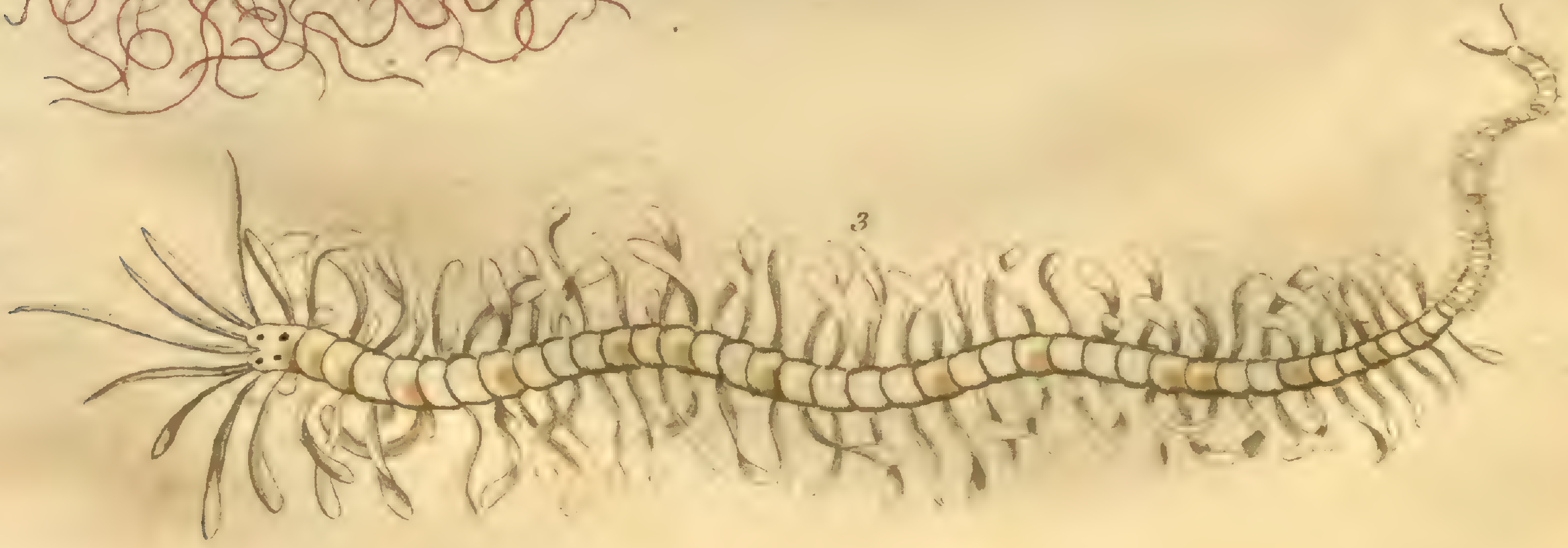

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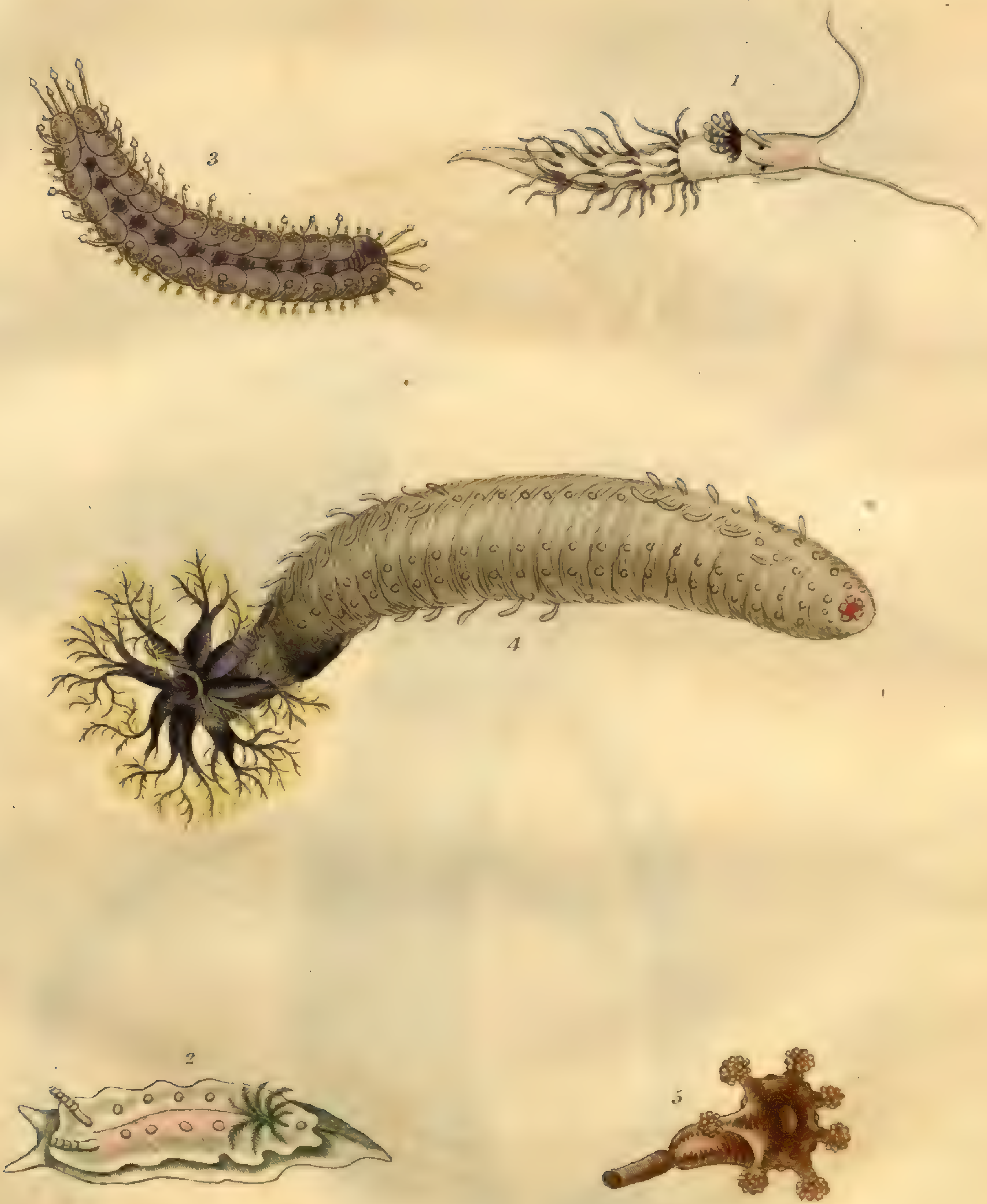

Eliza D. delin.

III. *An Account of the Indian Badger; the Ursus indicus of Shaw's Zoology.* *By Lieutenant Colonel Thomas Hardwicke, F.L.S.*

Read November 5, 1805.

As the descriptions of the Indian Badger given by the late Mr. Pennant, in his *History of Quadrupeds, No.* 216, and by Doctor Shaw, in his *General Zoology, Vol.* i. *page* 470, are unaccompanied by figures of that animal, I beg leave to submit to the Linnean Society an accurate drawing (Tab. IX.) of a full-grown living subject, with such remarks relative to the manners of the animal as were obtained from the natives of India, and from observation of a living one kept in my possession more than twelve months.

To Mr. Pennant's description, the following remark may be added—The claws are unequal: those of the fore feet very long, and awl-shaped; the three middle ones much longer than the two lateral; the interior toe very remote from the rest: those of the hind toes remarkably short, nearly equal, and bearing no comparison to the strength of the claws of the fore feet.

The subject here figured was a female: in length two feet four inches, of which the tail measured four inches. In height eleven inches. At *A.* is exhibited the under side of the hind foot.

This animal is found in several parts of India along the courses of the Ganges and Jumna, between the fortress of Chunar Ghur and Delhi: more particularly where the country is cut into ravines, and in the high banks which in many parts border those rivers. It is rarely seen by day; but at night visits neighbouring towns and villages, inhabited by Mahomedans, and scratches up the

recently buried bodies of the dead, unless they are thickly covered with thorny bushes.

The natives, when encouraged by the expectation of purchasers, dig these animals out of their subterraneous retreats, and take them alive: the full-grown ones are with difficulty secured, and seldom bear confinement long, but roll and beat themselves about till they die. When taken young, they are very manageable, docile, and playful. It is a bold animal; its hide remarkably thick, and its strength too much for most dogs of common size. Its general food is flesh in any state: but it is remarkably eager after birds; and crows, which were sometimes given to the badger I had domesticated, were devoured with impatient avidity. Living rats seemed almost equally acceptable: and it seldom lost the opportunity of springing upon common fowls, when they happened incautiously to be feeding within the length of its chain. It has the inclination to climb upon walls, hedges, and trees; this, however, it seems to execute clumsily, but seldom falls, and will ramble securely upon every arm of a branching tree, that proves strong enough to bear its weight without much motion. This species burrows with great facility; scratching the earth like a dog with the fore feet, and expelling the loosened soil to the distance of two or three yards backwards. In ten minutes it will work itself under cover in the hardest ground: and is restless till it can form such a retreat to sleep in. It sleeps much by day; is watchful during the night; discovering inquietude by a hoarse call or bark, proceeding from the throat. The hair of this animal is short and wiry, nor has it any of the softness of fur. This quadruped is known to the natives of Hindustan by the name of *Beejoo.*

TAB. IX. represents the *Ursus indicus*, one fourth of its natural size.

IV. *A*

A

IV. *A Botanical Sketch of the Genus Conchium. By James Edward Smith, M.D. F.R.S. P.L.S.*

Read March 4, 1806.

When the plants of New Holland were first examined, they presented, as I have had several occasions to remark, so much novelty and singularity to the systematic botanist, that the utmost caution was requisite in fixing their genera, and even, in some instances, their species. The proteus-like nature of the leaves of some kinds of *Mimosa, Metrosideros, Embothrium, Eriostemon* and others, might baffle the most acute observer, and elude the most able discriminator. I am obliged to Mr. Salisbury for first suggesting that my *Metrosideros lanceolata, linearis,* and *saligna, Trans. of Linn. Soc. v.* iii. 271, 272, are all varieties of one species, and that there are still more of the same in the gardens about London. I could scarcely have assented to this, had I not lately seen, in the greenhouse of my friend Mr. Cooper of Norwich, three plants raised from the seeds of one capsule of *Metrosideros,* of which any botanist in the world, not pre-informed, would make two, if not three, species. In such cases experience must be our only guide; and the most lofty science is often obliged to stoop, even on more important occasions, to the suggestions of this faithful nurse of truth.

In the generic arrangement of such novel productions the greatest botanists have been most sensible of the difficulty of their task, and have proceeded with proportionate caution. Thus

Thus the many new kinds of *Proteaceæ*, though by the judgment of Sir Joseph Banks and Dr. Solander readily separated from *Protea* itself, were not rashly subdivided into too many genera, till time, and an opportunity of observing them in different states, should throw sufficient light upon the subject. Some of them indeed, constituting a clear and certain genus, were made known to the younger Linnæus by means of plates, and dried specimens, and named by him *Banksia*; but a number of doubtful species have remained unsettled under the temporary denomination of *false Banksiæ* in the collections of those who had opportunities of acquiring New Holland specimens.

When the very imperfect materials, from which the botanical part of Dr. White's Voyage to New South Wales was composed, were put into my hands, I had not sufficient information to separate these false *Banksiæ* from the true ones. I therefore followed Gærtner in keeping them together, avoiding a precise definition of the generic character till I had seen the flowers. Mr. Salisbury has done the same in the *Prodromus* of his garden, where is a more ample enumeration of species than had before appeared, but their characters are not so satisfactory as some of this writer's.

In Professor Willdenow's *Species Plantarum* eight species of *Banksiæ* are enumerated, which comprehend, besides the real *Banksiæ*, two other very distinct genera, *Xylomelum* and *Conchium*, whose characters are given in the 4th volume of the Linnean Society's Transactions, p. 214, 215, and of the latter of which I shall now offer a further illustration.

The name, derived from κόγχη, a bivalve shell, was given in allusion to the peculiar form of the fruit, to which it strikingly applies. I was not then aware that, a little before my paper was even read to the Society, this genus had been determined at

at Göttingen by my friend Dr. Schrader, and published under the name of *Hakea* in his *Sertum Hannoveranum, p.* 27. *t.* 17, a name which the late Professor Cavanilles, justly regarding the right of priority, has preferred to mine. I might accede to this decision, however sorry to part with an apt and characteristic name, were I certain that *Hakea* were liable to no botanical exception. I have not been able to consult Dr. Schrader, but the very last letter from my most candid and ever-lamented friend *Cavanilles* was decisively in favour of *Conchium*, which he said he should in future adopt*.

I shall now proceed to define 12 species of this genus from my own observation, referring to each the synonyms of preceding writers, so far as it is possible even to guess at them, and choosing the best names afforded by those writers for such species as are not altogether new. Of Mr. Donn's names I am certain, having communicated them to him myself. His very useful work deserves every assistance.

For the character of the genus *Conchium* I need only refer to our 4th volume above quoted.

The species may be divided into 2 sections, the 1st with cylindrical, the 2d with flat leaves; though even this striking difference is not absolutely without exception, as will appear from the description of my 7th species, *Conchium trifurcatum.*

* *Foliis teretibus.*

1. Conchium *gibbosum*, foliis teretibus sub-pubescentibus fructu parùm longioribus, corollâ glabrâ, capsulis ovato-subrotundis gibbosis rugosis.

Conchium gibbosum. *Donn. Cant.* 21.

* M. Ventenat has also preferred this name for the genus before us, in his splendid *Jardin de la Malmaison.*

Banksia

Banksia gibbosa. *White. Voy.* 224. *t.* 22. *f.* 2. *Willden. Sp. Pl. v.* 1. 536.

B. pinifolia. *Salisb. Prod.* 51?

Hakea gibbosa. *Cavan. Ic. v.* 6. 24. *t.* 534.

H. pubescens. *Schrad. Sert.* 27?

Near Port Jackson, New South Wales. *Dr. White.*

The leaves of this species are from an inch and half to two inches long, as thick as a crow's quill, exactly cylindrical, bluntish, tipped with a sharp spine; when young they are clothed with short whitish hairs, which sometimes, but not always, fall off when the leaves are very old. Young branches hairy. Flowers axillary, two or three together, white, on simple very hairy stalks. Corolla quite smooth. Capsules solitary, the size of a moderate walnut, black and rugged, very protuberant at their under side; the valves extremely thick and woody, each tipped with a short sharp point; the cavity very small, eccentric and uneven. Seeds with black membranous wings, resembling gauze or crape.

2. CONCHIUM *sphæroideum*, foliis teretibus longitudine fructûs ramisque villosis, capsulis orbiculato-depressis læviusculis.

Near Port Jackson. *Dr. White.*

Leaves scarcely more than an inch long, very hairy. Branches clothed with dense woolly hairs. Capsules of a rusty brown, the size of the last, but much smoother, and of a different shape, being, when viewed vertically, almost orbicular, but depressed, their points scarcely projecting beyond the circumference. I have seen no flowers.

3. CONCHIUM

3. Conchium *aciculare*, foliis teretibus glabris longitudine fructûs, corollâ glabrâ, capsulis ovato-subrotundis rugosis apice productis.

Conchium aciculare. *Donn. Cant.* 21.*

Banksia tenuifolia. *Salisb. Prod.* 51?

Hakea sericea. *Schrad. Sert.* 27?

Near Port Jackson. *Dr. White.*

This is in all its parts about half the size of *C. gibbosum*, and the leaves are at every period of their growth (as far as I have seen) quite smooth, though the flower-stalks and young branches are silky. The whole fruit is more oblong than in the two former, but its lateral protuberances are more globose.

4. Conchium *longifolium*, foliis teretibus glabris fructu triplò longioribus, corollâ sericeo-villosâ.

Conchium longifolium. *Donn. Cant.* 21.

Banksia teretifolia. *Salisb. Prod.* 51.

Sent from Port Jackson. *Mr. Donn.*

The leaves are 3 inches long, or more, spinous, as in the three foregoing, apparently always smooth as well as the branches, but the corolla and flower-stalks are clothed with white silky close-pressed hairs, exactly as in *C. pugioniforme.*

5. Conchium *compressum*, foliis teretibus glabris vix longitudine fructûs, capsulis ovatis compressis torulosis.

Near Port Jackson. *Dr. White.*

I have not seen the flowers of this species. The capsules are

* Conchium aciculare. *Ventenat Jard. de la Malmaison, t.* 111.

 ovate,

ovate, partaking but little of the globular protuberant form of those above described, and are not more than an inch long. The leaves are scarcely so much, and are fully as slender as those of *C. aciculare.*

6. CONCHIUM *pugioniforme*, foliis teretibus glabris, corollâ sericeo villosâ, capsulis lanceolatis mucronatis basin versùs muricatis.

Hakea pugioniformis. *Cavan. Ic. v.* 6. 24. *t.* 533.

H. glabra. *Schrad. Sert.* 27. *t.* 17.

Near Port Jackson. *Dr. White.*

Leaves an inch, or inch and half long, always smooth, as well as the branches. The capsules are very peculiar. The flowers and their stalks agree with those of *C. longifolium*, which may probably be a variety of the present species, but this can only be determined by comparing their ripe capsules, which I have never been able to do.

7. CONCHIUM *trifurcatum*, foliis teretibus trifidis: quandoque dilatatis simplicibus ellipticis planis, corollâ villosâ.

Gathered by Mr. Menzies at King George's Sound, on the west coast of New Holland, latitude 35.

This species is most remarkable for the variation in its leaves from a cylindrical to a broad flat figure, even on the same branch. In the same leaf indeed it sometimes happens that the lower half is flat, the upper cylindrical. The most general form of the leaves, however, is cylindrical, divided about half way down into three, nearly equal, spreading, spinous points. The flowers and flower-stalks are shaggy, with spreading hairs, not silky.

** *Foliis planis.*

8. CONCHIUM *dactyloides**, foliis obovato-oblongis mucronulatis triplinervibus venosis, capsulis ovatis acutis.

Conchium nervosum. *Donn. Cant.* 21.
Hakea dactyloides. *Cavan. Ic. v.* 6. 25. *t.* 535.
Banksia dactyloides. *Gærtn. v.* 1. 221. *t.* 47. *f.* 2.
B. oleæfolia. *Salisb. Prod.* 54.

Near Port Jackson. *Dr. White.*

The leaves are flat, thick and rigid, smooth, entire, obovate, but varying in breadth and length, tapering at the base, and tipped with a short obtuse spine. They are marked with three principal nerves united above the base, the spaces between which are occupied either by transverse interbranching veins, or by other parallel nerves. Flowers small, white, very numerous, from axillary buds, in dense hairy tufts. Corolla smooth. Capsule ovate, acute, rugged, scarcely gibbous.

I should still gladly have called this *C. nervosum*, did I not totally disapprove of changing names given by good authors, unless when positively false or bad. Gærtner having seen only the capsules, could scarcely have contrived a better name than he did, and Cavanilles has given it additional authority. I have ascertained Gærtner's original name from Sir Joseph Banks's herbarium since I suggested to Mr. Donn that of *nervosum.*

9. CONCHIUM *ellipticum*, foliis ellipticis retusis muticis quinquenervibus reticulato-venosis, capsulis ovatis obtusis.

Brought by Mr. Menzies from King George's Sound.

Leaves 2½ inches long and 1 broad, exactly elliptical, obtuse,

* Conchium dactyloides. *Ventenat Jard. de la Malmaison, t.* 110.

 without

without spines, entire, almost sessile, somewhat glaucous, marked with five nerves which all spring from the base, and the spaces between which are beautifully reticulated with very numerous veins. Young branches downy. Capsule much like the last, but more obtuse. The flowers I have not seen.

10. Conchium *oleifolium*, foliis elliptico-lanceolatis mucronulatis uninervibus, capsulis ovatis gibbosis torulosis.

Near King George's Sound. *Mr. Menzies.*

Full-grown leaves scarcely an inch and half long, smooth and even, entire, obtuse, spinous, thick and rigid, with one nerve which throws off a few, scarcely perceptible, simple veins. When young, the leaves and branches are silky. Flowers smooth, in short axillary spikes, with a hairy common stalk, and smooth partial ones. Capsule ovate, gibbous on one side, and very rugged all over.

11. Conchium *ceratophyllum*, foliis trilobis pinnatifidis, capsulis ovatis compressis.

Near King George's Sound. *Mr. Menzies.*

Very remarkable for its large branching divaricated leaves, from 2 to 4 inches long, hard and rigid, obscurely ribbed, with all their lobes and teeth spinous. When young they are silky, as well as the flowers and their stalks, with a rusty tinge. Capsule of a narrow ovate compressed form, its outer coat smooth, and, as far as can be judged from its present appearance, succulent.

12. Conchium *salignum*, foliis lineari-lanceolatis acutis muticis uninervibus, capsulis ovatis gibbosis recurvis.

Conchium

Conchium salignum. *Donn. Cant.* 21.
Embothrium salignum. *Andr. Repos. t.* 215.

A native of the country near Port Jackson. It flowered at Messrs. Lee and Kennedy's in 1791, and in the conservatory of Thomas Johnes, Esq. at Hafod, in June 1798, from which last place I have received ripe capsules, serving to determine the genus.

The leaves are 5 or 6 inches long, smooth and pliable, of a narrow lanceolate form, entire, acute, but not spinous, furnished with one nerve, and a few lateral veins. Flowers small, white, smooth, in smooth axillary umbels. Capsule ovate, recurved, very gibbous, and somewhat rugged at each side, tapering at the base. Each of its valves is tipped with a lateral spine, as in several of the species that have cylindrical leaves.

J. E. SMITH.

Norwich, March 3, 1806.

V. *An Inquiry into the Genus of the Tree called by Pona* Abelicea cretica. *By James Edward Smith, M.D. F.R.S. P.L.S.*

Read March 18, 1806.

Botanists in investigating the tropical climates, have found there a copious harvest of arborescent plants, whose profusion, splendour and importance have, in a great measure, diverted their attention from the more diminutive and less ostentatious tribes of vegetables. On the other hand those situated in less luxuriant regions, have, in bending the chief part of their attention to the minute and intricate plants of such countries, too often slighted the apparently few and easy ones which were presumed to require little scientific examination. Hence we have been made acquainted with but a small part of the mosses, lichens, or other unornamental plants of hot countries, while the trees of cold ones have experienced a similar kind of neglect. I speak, however, in general terms only; for the curious and ample discoveries of a Swartz and a Menzies afford an exception to the former part of my position, as the labours of an Ehrhart do to the latter. Some allowance indeed is to be made for the difficulties of studying the species of *Populus*, *Salix*, *Betula*, *Ulmus*, &c. arising from the different seasons of their flowering and leafing, as well as their sexual differences. On the same ground I would apologize for those naturalists who have, since the days of Pona and Clusius, visited Crete without taking any notice of their *Abelicea*, or Bastard Sandal-wood, a tree which

 though

though in some degree an object of commerce, seems, as far as we know, peculiar to that island, and which no systematic author, that I can find, has noticed. Those great compilers and observers, Adanson and Lamarck, have passed it over in silence.

I shall first collect the slight memorials of this tree which already exist, and then add what I have been able to ascertain concerning it.

The earliest and most original account of the *Abelicea* is found in Clusius's *Historia Plantarum*, part 2, p. 302, in a letter to that great botanist from Honorio Belli, dated Crete, October 1st, 1594, and this it is worth while to translate.

" Abelicea, seeds of which I now send, is a large upright tree, " with abundance of branches, and of a handsome appearance. " Its leaves are like those of the *Alaternus*, but rounder and " deeply serrated. With the flowers I am unacquainted. The " fruit is the size of pepper, almost round, its colour between " green and black. The wood is hard, with a slight degree of " fragrance, insomuch that its saw-dust resembles that of san- " dal wood, and it might properly be denominated Bastard San- " dal-wood of Crete. This tree grows only on the highest sum- " mits of the white mountains, and is used for making beams. " I believe it to have been unknown to the antients, unless it " may be the Mountain Elm of Theophrastus, described in his " 3d book, chap. 14, but the leaves are neither slightly serrated, " nor so large as those of a pear; on the contrary they are much " smaller. It is called ἀπελικέα."

Pona, in the Italian edition of his Description of Mount Baldus, published in 1617 at Venice, p. 112, gives a wooden cut of the branches and leaves of the tree in question, which figure he received from Honorio Belli. A description is annexed, very nearly agreeing word for word with the above, but certainly not

copied

copied from the publication of Clusius, for the following passages are interspersed——that "he hopes another year to send Pona the flowers," that "the fruit as above described was unripe," and that "the wood is red." The particular place of growth, and the reference to Theophrastus are omitted, but Pona subjoins the following information.

"The trunks of this tree have been, within a short time, "brought to Italy, and bought by some persons, who sold them "for Sandal-wood. It differs, however, from the genuine wood "of that name, especially in being less heavy."

From these writers the *Abelicea* found its way into Bauhin's *Pinax*, p. 393, by the name of *Pseudosantalum Creticum*, but without any new observation. The account of it, extracted from Clusius, occurs also in J. Bauhin's *Historia Plantarum*, *v.* i. 490, without a figure, or any reference to Pona. In Ray's *Historia Plantarum*, *v.* ii. 1805, we find merely a transcript of J. Bauhin, with a reference to Parkinson, whose book I have not at hand, but it can scarcely contain any further information on this subject.

On turning to Theophrastus I find no reason to consider it as his ὀρειπτελέα or Mountain Elm, for the only characters given of that tree, and which are quoted by Belli in the above extract, serve to prove them perfectly different plants.

In Tournefort's herbarium specimens of the *Abelicea*, with a reference to John Bauhin, are preserved, but I can find no mention of it either in his *Voyage*, his *Institutiones*, or his *Corollarium*. He probably gathered it in Crete, but did not observe the fructification.

Specimens gathered, either by that great French botanist or others of his time, are to be found in various collections. One of them was sent by Schreber to Linnæus, without fructification, marked

with

with C. Bauhin's synonym. This Linnæus never ventured to describe. He had received from some other quarter an equally imperfect specimen of the tree named in the *Hortus Kewensis, Ulmus nemoralis*, which bears at least a generic resemblance in habit to the *Abelicea*, but the leaves are twice as large, and not downy (except near the nerves) beneath. These two specimens Linnæus pinned together, and wrote on the last-mentioned *ABCdaria*, laying them both into the genus *Quercus*. Whether this arose from the slight resemblance between the names *Abelicea* and *ABCdaria* I will not venture to guess, but the latter denomination, used by Rumphius only, belongs to a *Verbesina*, and has no proper connection with the plants of which I am speaking.

The union of these two specimens in the Linnean herbarium first led me to suspect the *Abelicea* might be an *Ulmus*, or at least next akin to that genus. Specimens of the *Ulmus nemoralis*, in flower and fruit, were given to the younger Linnæus at Paris, by the name of *Ulmus polygama*, and I think there can be no doubt of its being what Pallas has described and figured under the denomination of *Rhamnus carpinifolius*, *Fl. Ross. v.* i. *t.* 60, though he justly doubted whether he were right as to the genus. The fruit, indeed, in the imperfect state in which Pallas as well as Linnæus had it, is not much like an *Ulmus*, but it bears less resemblance to a *Rhamnus*.

In Dr. Sibthorp's herbarium I find specimens of the *Abelicea*, gathered by him probably in Crete, though no mark is annexed to them, nor do I discover any mention of the *Abelicea* among his papers. These specimens, however, are valuable for being in fruit, and they agree in that part with the supposed *Ulmus* above mentioned. On these grounds I have ventured to admit the tree in question into my *Prodromus Floræ Græcæ* by the name

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of *Ulmus? Abelicea*, hoping to excite others, whenever they may have an opportunity, to examine its living fructification, as well as that of the *Ulmus nemoralis.* By this means their genus, which is certainly one and the same, though perhaps different from *Ulmus*, but which I am obliged to leave in doubt, will be ascertained. It is thus that botanists should co-operate to bring their "lovely science" to perfection. Linnæus and other great masters have necessarily left many things imperfect and in doubt, particularly with regard to genera. These I have uniformly lent my aid, whatever it may be, to elucidate from time to time, particularly such as concern the Flora of Britain, being, if I mistake not, the first writer among us who undertook to examine them, and who did not implicitly copy Linnæus as a matter of course. I am now pursuing the same plan in the Greek Flora. Much must be left for following observers, and I have always preferred leaving things as they are, to any hasty or rash alteration. Several have taken up the same subject; none with more zeal than Mr. Salisbury, and I trust he will pursue it so as to render service to the science. The world is now in expectation of a learned essay on this subject from his pen.

J. E. SMITH.

Norwich, March 15, 1806.

VI. *An*

VI. *An Inquiry into the real Daucus Gingidium of Linnæus. By James Edward Smith, M.D. F.R.S. P.L.S.*

Read April 1, 1806.

I HAVE often had occasion to remark that when Linnæus adopted species of plants into his systematic works on the authority of other authors, he has been peculiarly liable to error. There seems to be a fatality attending his medicinal plants, no doubt from the great difficulty of penetrating through the clouds with which ignorance, interest and fraud for the most part envelop such articles of the Materia Medica as are brought from remote countries. Even when all these sources of delusion do not exist, bad figures and imperfect descriptions are but fallacious guides; nor is any thing but the sight of a good specimen sufficient to prevent mistakes, even in the most wary, occupied in so vast a study as botany is now become.

Sometimes Linnæus was induced by a striking figure, name or description, to attempt a characteristic definition of a plant which he had never seen. In that case he generally retained its original denomination as a specific name. Now it frequently happened, from the defects of his authorities, or a failure in his own memory, that when he saw the real plant he did not know it, and perhaps described it over again as new. His various editors could scarcely detect such mistakes, and perhaps would hardly dare to suspect them. Even when he commits an error in copying a synonym, they seem afraid of correcting

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what is obviously wrong; or else they have been unpardonably negligent in not turning to the authors quoted, for this at least was in their power, and it is one of the things which is, of all others, most indispensable in an editor. How necessary it is with respect to the editions of Linnæus's works, printed and reprinted by awkward and ignorant hands in various countries, no one who has used them can be uninformed. I had abundant experience of this necessity in republishing even his original *Flora Lapponica*, and the history of *Daucus Gingidium* will afford examples of every thing to which I have just alluded.

This plant is mentioned in the 1st edition of the *Species Plantarum*, *p.* 242, with the following definition. DAUCUS *radiis involucri planis: laciniis recurvis*, and a reference to Van Royen's *Floræ Leydensis Prodromus*, is subjoined. There we find the same specific character, as well as the same quotations of Bauhin and Matthiolus, except that Van Royen cites the large Valgrisian edition of the latter writer, and Linnæus the small one, not having the other. No further information is to be found in Van Royen. Linnæus quotes a synonym from Magnol, and another from Boccone's *Plantæ Siciliæ*, both which appear to me very doubtful. It is not, however, necessary to scrutinize them, as the authority of this species evidently depends on the figures of Matthiolus, from which the character is in a great measure taken. Linnæus had no specimen of it in his herbarium, but as he has not annexed the cross (†) to express his never having seen it, I presume he might have examined a specimen in the hands of his confidential friend Van Royen.

In the 2d edition of the *Species Plantarum*, every thing is repeated from the former, with the addition of a synonym from Tournefort, *Daucus montanus lucidus, Tourn. Inst.* 307, in which there is a remarkable error, for in Tournefort it is *maritimus*, not

 montanus;

montanus; and yet this erroneous citation is perpetuated in the Vienna edition, in Reichard, and in Willdenow. How could these able editors at the same time overlook the excellent figure of Rivinus, *Staphylinus folio latiore, Riv. Pent. Irr. t.* 30, which unquestionably belongs to our plant?

I am not acquainted with the *Daucus polygamus* of Gouan, *Illustr. p.* 9, to which the above synonyms of Boccone and Magnol are now applied, but I conceive it to be very different from the *Gingidium*. I do not presume absolutely to decide on this question, but I beg leave to observe that Gouan seems not acquainted with the true *Gingidium* by name, for he says the figure in Boccone's *Museum, t.* 20, quoted under his *Daucus hispanicus*, agrees better with *Gingidium*. Now that figure is not at all like the true *Gingidium*, with which latter, however, Gouan's description of his *D. hispanicus* so well agrees, that I am persuaded the plant he has described under this last name is truly the *D. Gingidium* of Linnæus.

In his declining years Linnæus cultivated in the Upsal garden a *Daucus*, a specimen of which is preserved in his herbarium without any trivial name. This is described in the *Supplementum* under the name of *lucidus*, without any synonym, and said to come from *Mauritania*. This specimen is evidently the *Gingidium* of Matthiolus, with whose figures, in both editions, it strikingly accords, and even still better with the Linnean definition of the *involucrum, laciniis recurvis*. This last excellent character not being well expressed in those figures, convinces me of Linnæus having originally described the *Gingidium* from nature. It is remarkable that neither he nor his son should have compared this specimen with the definition or synonyms of *D. Gingidium*, with which it so perfectly agrees; but they were perhaps misled by a specimen in their herbarium marked *Gingidium*, which is really the *Daucus* (or more properly, as the French botanists make it, *Ammi*) *Visnaga*.

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As I never met with an authentic specimen of *Daucus Gingidium* in any herbarium, I presume the above detail may not be useless. It shows how much attention is necessary to avoid error in botanical synonyms, and how essential it is, in all difficult cases, to trace the history of a plant to its sources. I believe there is scarcely a genus, among the umbelliferous plants in particular, which would not afford matter for several such disquisitions as the present.

J. E. SMITH.

Norwich, March 25, 1806.

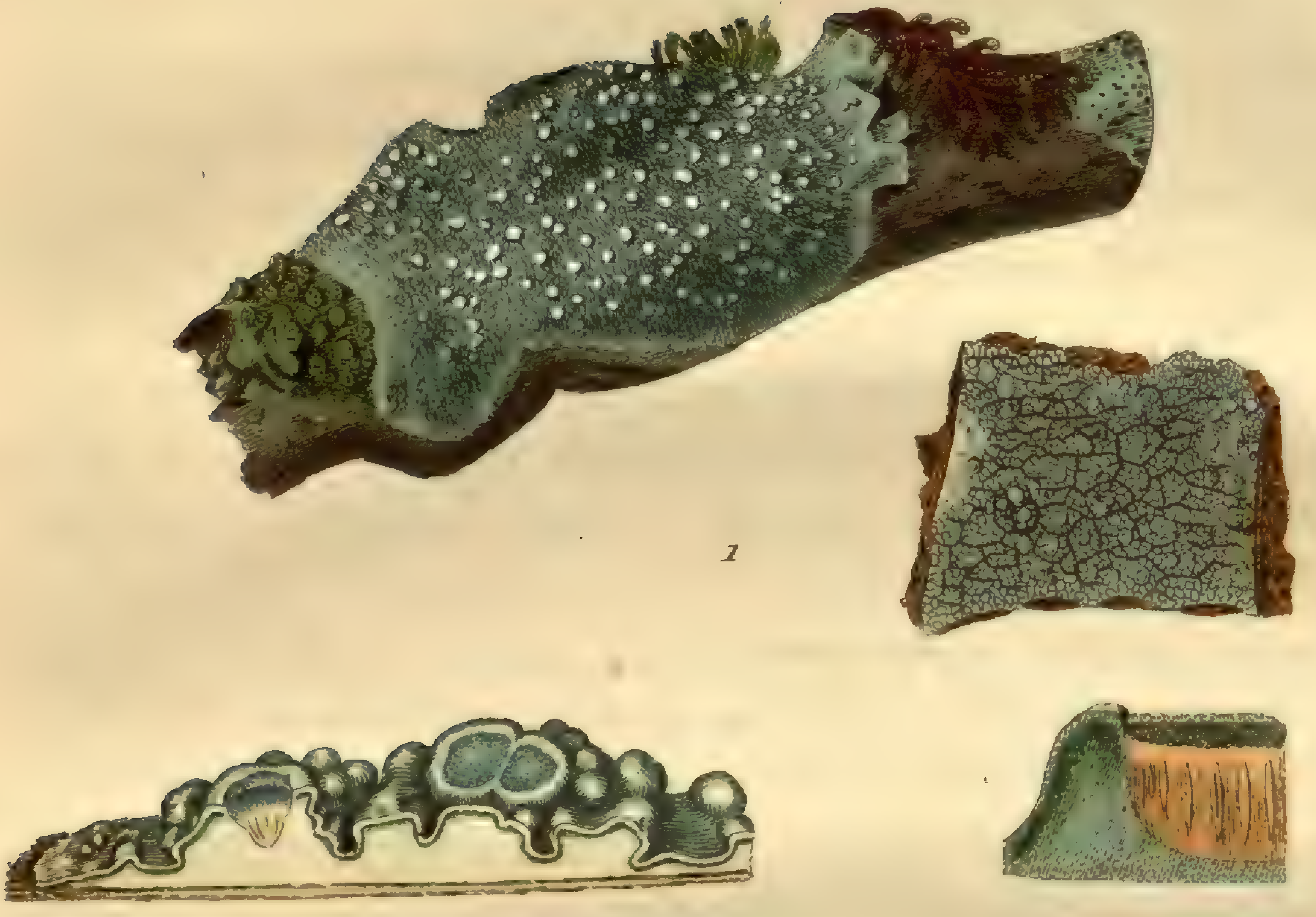
VII. *De-*

VII. *Descriptions of Eight New British Lichens. By Dawson Turner, Esq. F.R.S. A.S. and L.S.*

Read June 3, 1806.

In submitting to the Linnean Society descriptions of the eight following Lichens, I feel it necessary to preface my observations upon their individual characters, by briefly alluding to the changes which have been effected in the study of these plants subsequently to the time when I wrote the paper upon a similar subject, which the Society did me the honour of inserting in the seventh volume of their Transactions. It can scarcely be necessary to mention that the changes to which I refer are those introduce by Dr. Acharius in his *Methodus Lichenum*, a work which may in my opinion be regarded as tending most essentially to facilitate the study of this obscure, yet beautiful and interesting tribe of vegetables, as laying the foundation for enabling us to prosecute the investigation of them upon solid principles, and as having thrown more light upon their real nature and physiology, than could reasonably be expected in the present imperfect state of our acquaintance with the subject. The genera established by this able author are already almost universally received among the botanists of neighbouring countries; and it is with peculiar satisfaction that, convinced myself by experience of their excellence as well as of the necessity of employing them, I avail myself of an opportunity of directing towards them the attention of the naturalists of Britain. It is by no means my intention

intention here to enter into an enumeration of the various attempts which had previously been made to subdivide the vast tribe of Lichens, or even to offer any observations upon the Acharian system, further than may be called forth by the particular individuals which I am about to describe. Such inquiries, however interesting to myself, would lead me into a field far too wide for my present object; and, as in describing the plants themselves I shall have occasion to give the definitions of the genera to which they belong, I will merely add, that I trust I shall not be accused of presumption or of an idle itch for innovation, in being the first who ventures to use in Britain a new arrangement of these plants. No one is more deeply impressed with a sense of the necessity of rigidly abstaining from all useless alteration of names, or multiplication of synonymy. Our botanical nomenclature is already so extensive and intricate as to be perplexing to all, even to those most conversant with the subject, and to deter many from joining us in the prosecution of the science; yet considerations of this nature must not be allowed to be carried too far. Every branch of human knowledge requires in proportion to its development an extension of its technical terms, without which its progress would effectually be checked. Had this been denied, the discoveries of Linnæus or of Hedwig themselves had been nipped in the bud; and I must be allowed to state it as my opinion, that many of the alterations proposed by Dr. Acharius in the nomenclature of the Lichens, however troublesome it may be to us at present to unlearn what we have long since learned, will be found not less important in extending the knowledge of these plants than his new system. Upon the propriety, or rather the necessity, of subdividing the numerous vegetables now arranged under the one vast genus, Lichen, and I believe all botanists, who have bestowed upon



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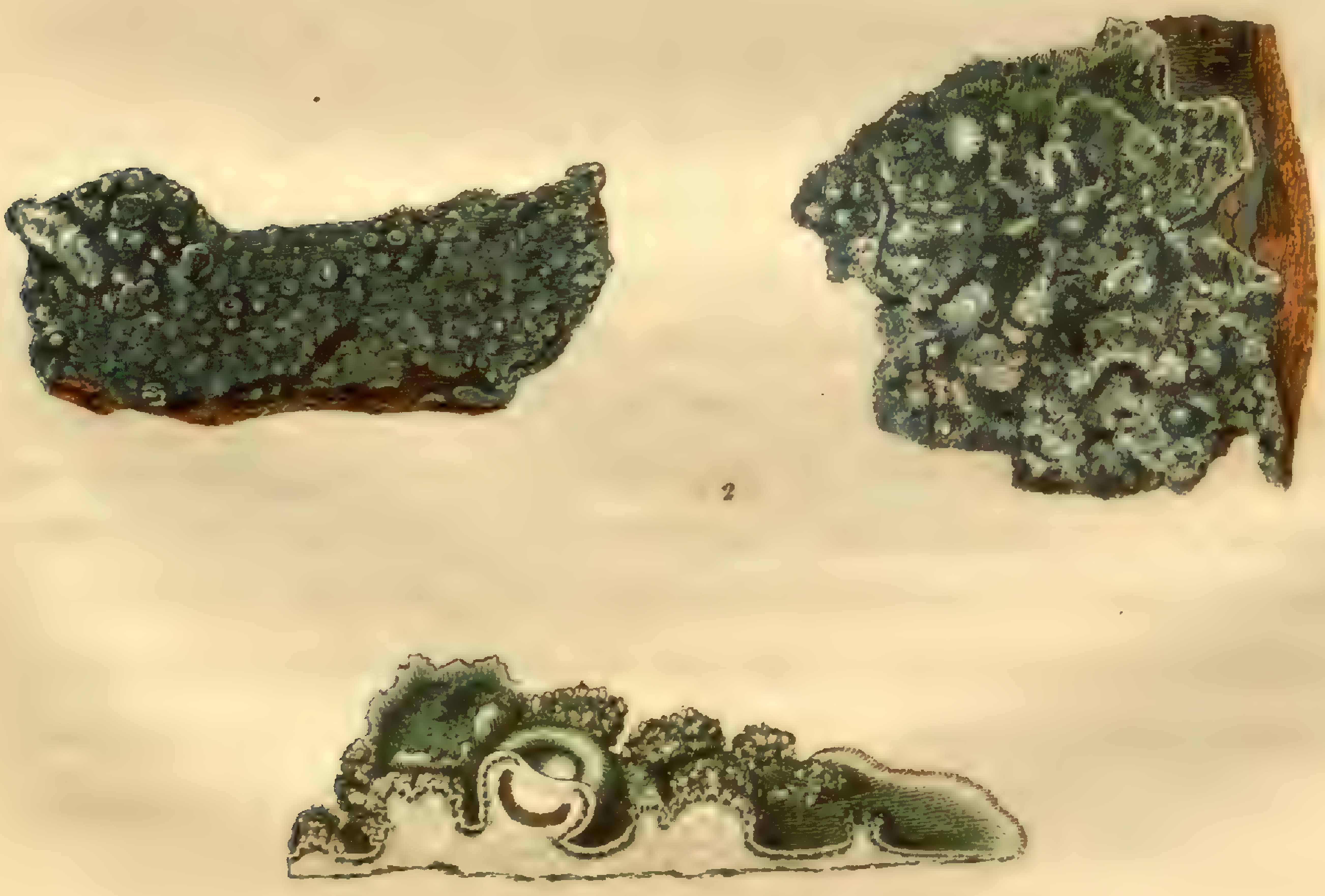

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the subject an attention the most superficial, to be so fully agreed, that there is no occasion for a single argument to be employed: were any necessary, the most substantial one would be found in the number of British species, which is already known to amount to 350, which is almost daily increasing, and which comprehends various tribes of a nature the most dissimilar to each other. It only remains for me, therefore, to express my obligations to my friend Mr. Borrer, who has furnished me with the materials of the present paper, who has applied himself to the study of the indigenous Lichens with a zeal and success which I believe to be altogether unrivalled, and whose opinions, I am happy to add, coincide with my own.

VARIOLARIA MULTIPUNCTA.

Variolaria, crustâ membranaceo-verrucosâ rugulosâ tartareâ cinerascente; sorediis hemisphæricis albis multipunctatis; propagulis griseis.

TAB. X. Fig. 1.

On beech-trees in Sussex, not uncommon. *Mr. Borrer.*

Alga arborea, crustacea, sub-orbiculata, diametro bi-tri-pollicaris.

Crusta determinata, ambitu albo fibrilloso, in plantâ juniore, et semper prope margines, tenuissima, in vetustâ rugosa, verrucosa, et in areolas irregularitèr diffracta, *madefacta* e griseo virescens, *siccata* alba, nitoris semper expers.

Soredia satis frequentia, hemisphærica, margine, ut in *Parmeliis*, a crustâ formato, disco in stirpe juniore albissimo, in adultiore griseo; *soredia* oculo inermi tri-quadri-punctata apparent,

rent, quod, si per lentem conspiciantur, e discis plurimis in eodem apothecio nidulantibus pendere cernes.

Substantia primò membranacea, mox tartarea.

In the *Methodus Lichenum* there is, perhaps, no genus of which the fructification is so unsatisfactorily explained as that of *Variolaria*, nor any term which is used so indefinitely as that of *Soredia*, applied by the learned author to the receptacles of this tribe. Upon this subject I should have been tempted here to have transmitted some observations, had not Dr. Acharius himself lately apprised me, that in his *Lichenographia universalis*, now just ready for the press, the true *apothecia** of these plants will be carefully described, and the whole character of the genus revised and amended. I therefore leave the subject to his more able hands, confining my remarks to the present and following species. *Variolaria multipuncta* is found by Mr. Borrer in abundance upon the younger branches of the Beech in Sussex, but I have never received it from any other quarter: it is not only a very beautiful, but a curious and interesting species, showing the transition of nature from these plants to the *Thelotremata*, its receptacle, which, viewed by the naked eye, appears only pitted on the surface, being in reality common to two or three pale waxy disks, in which circumstance, I believe, it differs from every other species already known. The old *apothecia* have greatly the appearance of the shields of a *Parmelia*, and in these the surface of the disk is dark gray, the margin being of the colour, as well as the substance, of the crust, and inflexed. The crust is white within, except that it has a thin layer

* I am aware that Acharius, in his Methodus, denies *Apothecia* to the *Variolariæ;* but in a letter which I lately received from him, he admits their existence, and I have therefore not hesitated here to employ the term.

of

of green immediately beneath the surface. It is wholly destitute of that intensely bitter taste which prevails in *V. faginea*, and which, as Mr. Borrer has most justly observed, will always serve to distinguish that plant from all the varieties of *V. discoidea*.

Variolaria globulifera.

Variolaria, crustâ tartareâ effusâ glaucescente; sorediis sphæricis clausis, mox apice dehiscentibus; propagulis niveis.

Tab. X. Fig. 2.

On the bark of beech, and sometimes of oak, in Sussex, scarce. *Mr. Borrer.*

Alga arborea, crustacea, absque ullo ordine effusa, latitudine palmaris, et ultra.

Crusta crassiuscula, sub-æqualis, continua, lævis, sed hìc illìc pulvere albo quasi per crustam erumpente, perfusa, qui interdum ita copiosus, ut tota planta pulverulenta evadat, colore e glauco albicante in stirpe cum madefactâ tum siccâ eodem.

Soredia nequaquam frequentia, sphærica, *pisi sativi* seminis ferè magnitudine, margine crustæ concolore, et quasi ab illâ formato, centro depressa, impressione principio parvâ, et membranâ tenui obtectâ, mox se dilatante, et demum dehiscente unde propagula nivea elabuntur: in soredio dissecto discus intensè viridis, tenuis, propagulis undequaque cinctus se conspiciendum præbet.

Substantia tartarea.

The unequal and filmy, yet tartareous crust of this Lichen spreads widely over the bark, breaking forth every where into

 powdery,

powdery, or rather granulated warts, which soon become confluent, and not unfrequently cover the whole surface. The true fructification, which is very sparingly produced, is widely different from these, or indeed from the fruit of any other *Variolaria* at present described; so that the plant might, before it is accurately examined, be regarded as constituting a new genus. It consists of smooth white globules, bearing considerable resemblance to some of the smaller Lycoperdons, nearly equal in size to a common pea, at first perfectly spherical and closed, but soon discovering an impression in the centre covered with a thin membrane, which gradually enlarges, till at length it bursts, and the *propagula* falling out, leave the appearance of a large concave scutella, not unlike that of *Lichen spongiosus*, *Eng. Bot.* with a thin lacerated margin, and deep green, waxy disk. Mr. Borrer observes respecting this plant that it has been supposed to be the perfect state of *V. faginea*, and is scarcely distinguishable from that species, except by its wholly wanting the bitter taste, and by its remarkable receptacles, which are by no means generally produced. He adds that he has reason to believe that *V. faginea*, when perfect, produces something similar to these, which are perhaps the proper fructification of the genus, *Variolaria*, the contents of the powdery warts being, probably, analogous to gemmæ.

Lecidea aromatica.

Lecidea, crustâ effusâ glebulosâ sub-imbricatâ albo-cinereâ; patellulis nigris concavis.

Tab. XI. Fig. 1.

On old walls, generally upon moss or mortar, in Sussex. *Mr. Borrer.* At Bury. *Rev. G. R. Leathes.* About Norwich and Yarmouth, plentiful.

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Alga crustacea, muralis, effusa.

Crusta in pulvinulum inflata, pollicem circiter diametro, e glebulis tota constans: glebulæ approximatæ, vix conjunctæ, interdum laxè imbricatæ, *papaveris* semine majores, compressæ, orbiculares, vel margine irregularitèr lobatæ; *recentes* æquè ac *desiccatæ* albæ, aut cinereæ, interdum viridescentes.

Patellulæ per totam crustam absque ordine sparsæ, frequentes, nec rarò coacervatæ, nigræ, ortu et siccitate concavæ, margine concolore, crasso, elevato, adultæ hemisphæricæ et marginis expertes, orbiculares vel per mutuam pressionem angulosæ.

Substantia tartarea, in siccâ fragilis.

The most striking peculiarity of this Lichen must certainly be considered the delicious and highly aromatic fragrance which both the crust and shields, but especially the former, give out when rubbed between the fingers in a recent state, and which, though in a less degree, the plant often retains for some years. In this circumstance I am not aware that any British Lichen resembles it, excepting only *Lecidea cæruleo-nigricans*, in which a similar smell may sometimes, but by no means always, be perceived. *Lecidea aromatica* belongs to so intricate and embarrassing a subdivision of the genus, that, in spite of the peculiarity just mentioned, which I have always found constant, I should scarcely have ventured to propose it as a new species, had I not in support of my own opinion the sanction of Dr. Acharius, Dr. Swartz, and Mr. Borrer, the two former of whom consider it distinct from any with which they are acquainted, and the latter has been in the habit of observing it for many years, during which he has never found it liable to variation. Its closest natural affinities are with *Lecidea atro-alba* and *L. cæruleo-nigricans*, between which it stands almost intermediate: of these the

first

first differs in being at its origin formed of a thin black crust, on which the white glebules and black shields afterwards arise; never, as far as I have seen, covering it, but giving the whole plant a singularly varied appearance; while in *L. cæruleo-nigricans* the glebules are always much larger, inflated, and wearing a pruinose appearance, of which I never saw any traces in *L. aromatica.* From *L. parasema* and all its affinities the widely different crust and habit effectually remove it.

Lecidea atro-flava.

Lecidea crustâ effusâ tenui membranaceâ sub-granulosâ atrâ; patellulis concavis flavis, margine integro elevato dilutiore.

Tab. XI. Fig. 2.

On flints upon the Downs about Brighton. *Mr. Borrer.* Heaths near Bury. *Rev. G. R. Leathes.*

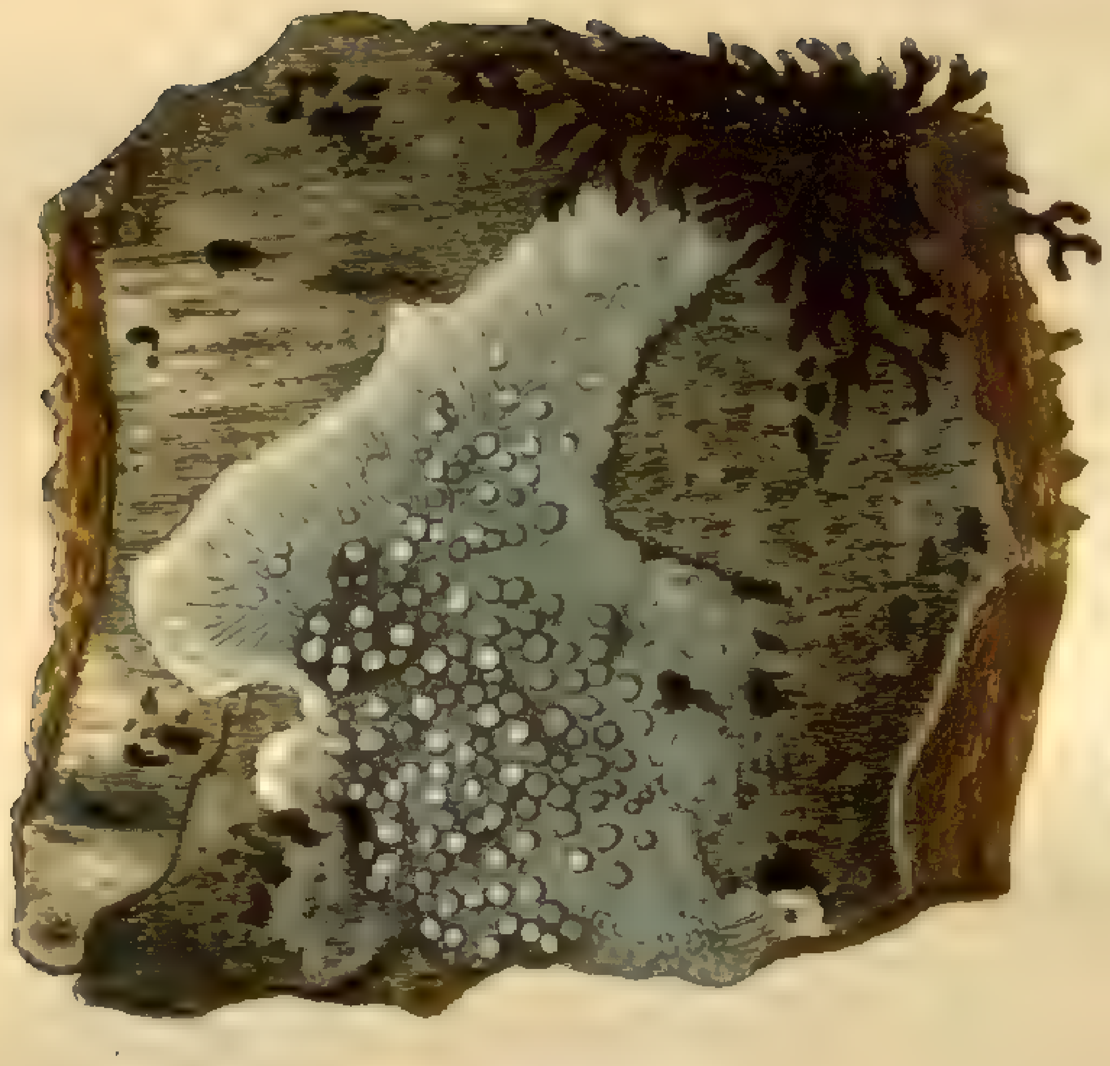
Alga saxatilis, crustacea, effusa.

Crusta tenuissima, continua, lævis, in plantâ vetustâ sæpe hìc illìc præsertim centrum versus lenitèr granulosa, absque ordine effusa, sed non raró ambitu pulcherrimè fibrillosa, *madefacta* æquè ac *siccata* atra, aut atro-fusca, nitoris omninò expers.

Patellulæ frequentes, orbiculares, exiguæ, juniores excavatæ, et margine crassiusculo tumente inflexo propemodùm clausæ; in adultioribus discus explanatur, convexus, vel planiusculus, sed margo semper elevatus, integerrimus; color disci *madefacti* aurantiacus, subdiaphanus, *exsiccati* lætè flavus, marginis semper dilutior.

Substantia membranacea.

The brilliant yellow shields of this Lichen form so lively a contrast with the dull black crust, that it deserves to be reckon-



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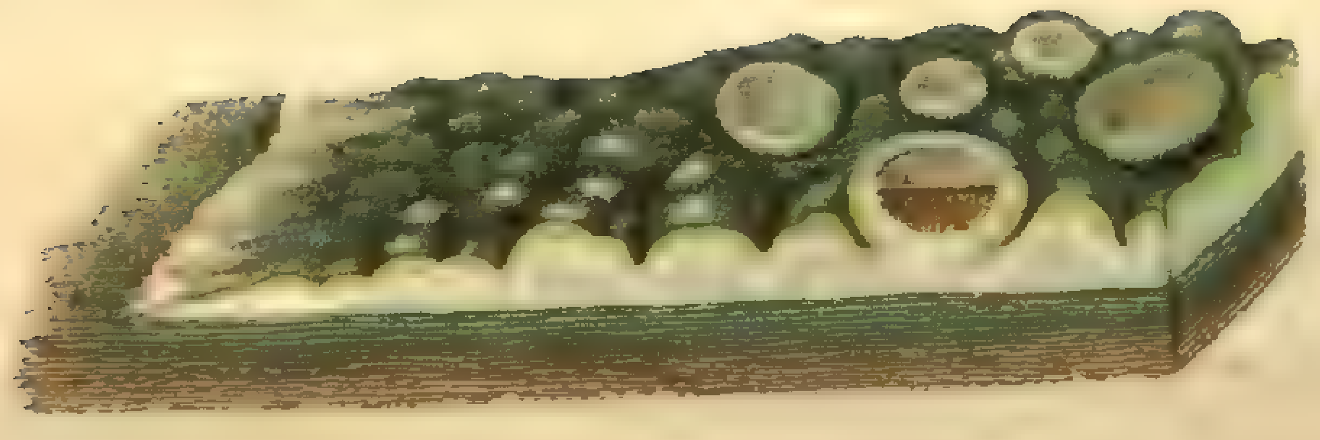

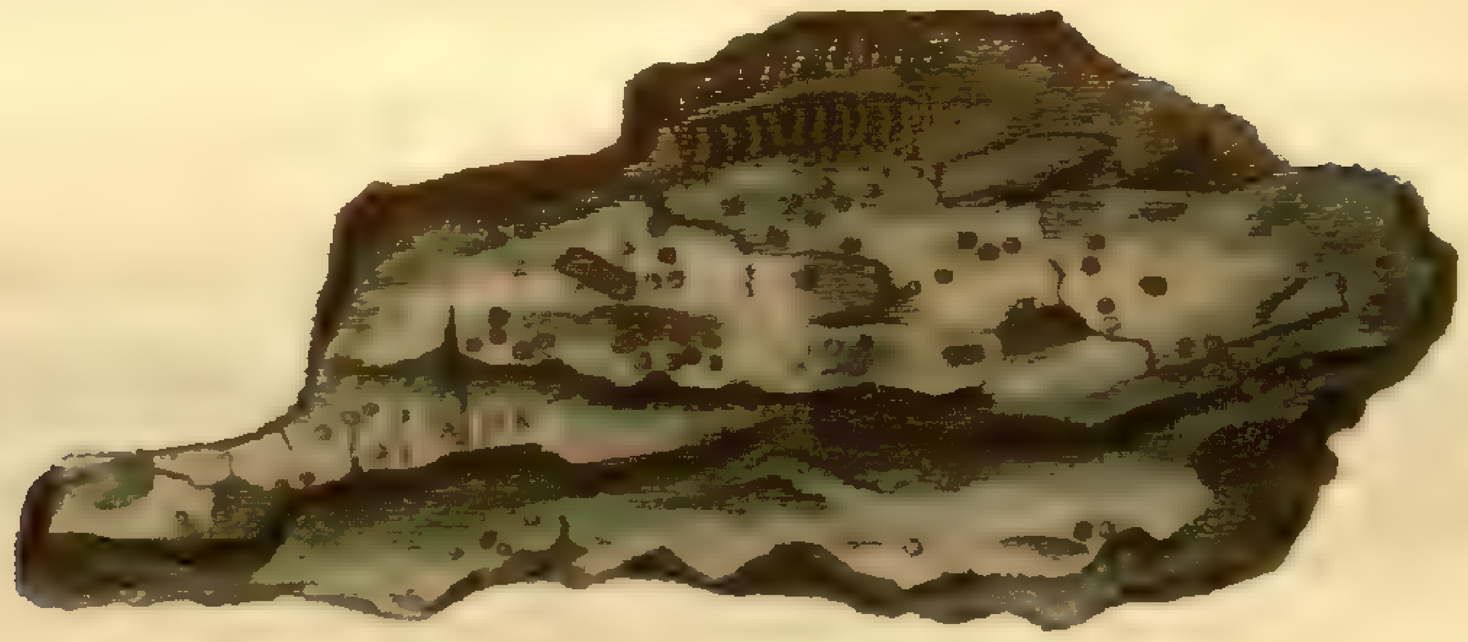

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ed among our most beautiful British species. I received it many years ago from Spain upon the young shoots of smooth-barked trees, but it appears to have been found in England only upon the bare surface of flints, over which it spreads in patches of most irregular form and size, bearing in its more early stage, before the shields are yet visible, the strongest resemblance to *Verrucaria umbrina.* It needs scarcely to be remarked, that the even substance upon which it grows is the cause of its not unfrequently occurring with an elegant border, composed of the most minute glossy parallel fibres, the same being common to many other crustaceous Lichens under similar circumstances. I apprehend that the cause of *Lecidea atro-flava*'s having so long escaped notice, must depend either upon its being a very uncommon species, or upon its being overlooked as a variety of *Lecidea cinereo-fusca**, with which it frequently grows intermixed; but from which it may at all times and at first sight be distinguished, not only by the colour and nature of the crust, but by the shields, which are in the one remarkably vivid, and in the other no less remarkably dull. I am not aware that there is any other *Lecidea* to which the present approaches so nearly as to make it necessary particularly to point out the essential characters that discriminate them.

PARMELIA VELATA.

Parmelia crustâ determinatâ membranaceo-verrucosâ rugulosâ albicante; scutellis exiguis congestis, disco plano flavicante membranâ albicante obtecto.

TAB. XII. Fig. 1.

On ash trees in Sussex; rare. *Mr. Borrer.*

* *Lichen ferrugineus* of British authors.

Alga

Alga arborea, irregularitèr orbicularis, diametro bi-tri-pollicaris, interdum semipedalis.

Crusta ambitu obsoletè zonato-limitata, membranacea, tenuissima, lævis, in stirpe adultiore centrum versus crassior, subverrucosa, et levitèr rugosa.

Scutellæ ita copiosæ ut non rarò crustam ferè totam occupant, congestæ, exiguæ, et *papaveris* semine vix majores, orbiculares, sed mutuâ pressione interdùm angulosæ, margine crustæ concolore, crassiusculo, integerrimo, vix, aut ne vix, elevato, disco semper plano, membranâ tenuissimâ, ejusdem quâ margo substantiæ, et quasi ab illo ortâ, obtecto, unde stirpi *Lecideæ* facies, intus pulchrè flavicante.

Color crustæ albus, glaucescentiâ tinctus, sine nitore, in plantâ siccâ et madefactâ idem.

Substantia e membranaceo tartarea.

The scutellæ in this Lichen are very remarkable, the membrane that covers the disk being to all appearance of the same substance as the margin, and a continuation of it, so that they have altogether the look of the *patellulæ* of a *Lecidea*. The edge of the crust is not composed of minute parallel fibres, as in *Lecidea atro-flava* and many of the species growing on stone, but rather resembles that of some *Variolariæ* or of *Isidium coccodes*, being extremely thin, silky, and obsoletely zoned. The situation of *Parmelia velata* is between *P. albella* and *parella*, to the latter of which it is by far most nearly allied, indeed so nearly, that, though I have the sanction of Dr. Acharius and Mr. Borrer for thinking them distinct, and though I have myself gathered them in plenty in Sussex, without perceiving any immediate gradation, I would not be understood as speaking without much diffidence upon the subject. *P. velata* is distinguishable from

P. albella

P. albella by its minute clustered shields, never dilating, as in that species, by their thick not elevated margin, and by the colour of their disk, which, however, is not discernible except the plant is injured. From *P. parella* it also differs in the size of the shields, and their never spreading, as well as the thickness of the margin, and its not rising above the disk.

PARMELIA CARNEO-LUTEA.

P. crustâ membranaceâ tenuissimâ effusâ albâ; scutellis sub-immersis planiusculis luteis, junioribus margine involvente lacero ferè clausis.

TAB. XII. Fig. 2.

On the bark of old elms about Lewes, Albourne, Steyning, Southwick, and Hastings in Sussex. *Mr. Borrer.*

Alga arborea, crustacea, latè et absque ullo ordine effusa.

Crusta tenuissima, ut oculo inermi tantùm macula alba appareat, æqualis, lævigata, continua, *madefacta*, æquè ac *sicca*, alba, nitida.

Scutellæ frequentes, nec rarò conglomeratæ, orbiculares, perquam exiguæ, sub-immersæ, disco planiusculo, in vetustis convexo, margine crustæ concolore, elevato, scutellas juniores involvente, et propemodùm claudente, mox lacero, et ætate, ut videtur, detrito, et crenulato; disci *madefacti* color pallidè luteus, exsiccati corneus.

Substantia membranacea.

The crust of this Lichen is so exceedingly thin, that its appearance at first sight is nothing more than that of an unusually

bare and smooth part of the tree: nor can its fructification be discovered without attentive examination; for even the shields are by no means of a nature, either from their colour or size, to strike a cursory observer. Mr. Borrer, therefore, suspects, and, as it seems, not without reason, that the gray tinge frequently observable on the bark of old elms belongs in reality to this plant, though neither he nor I were ever able to detect any fruit beyond the borders of Sussex. The nature of the shields is so peculiar, that a few remarks with respect to these is all that it can be necessary to say for the purpose of effectually discriminating this Lichen from its congeners. They are very different from those of any other *Parmelia*, and more resemble the *apothecia* of *Urceolaria exanthematica*, being almost wholly immersed in the crust, and in their first stage enveloped by the margin, which soon splits into different segments, though not with the regularity observable in that plant, disclosing the flat, yellowish, or flesh-coloured disk. In the older shields the margin becomes worn down, so as to be level with the disk, and is in this state thick, obtuse, uneven, and crenulated; it is also sometimes quite obliterated. The place to be assigned to *P. carneolutea* in the *Methodus Lichenum* is that immediately following *P. rubra*, from which it is distinguishable by the smoother crust, the colour of the disk of the shields, their immersed situation, and their margin; or, when this is worn away, by the disk being by no means concave, but flat, or slightly convex, with a slightly perceptible whitish edge.

PARMELIA CLEMENTI.

Parmelia thallo crustaceo-membranaceo orbiculari sorediato albido,

Linn. Trans. Vol. IX. tab. 13. p. 147.

bido, margine lobato, lobis dilatatis brevibus multifidis; scutellis atro-lividis, margine inflexo albo.

Tab. XIII. Fig. 1.

On trees, and roofs, in Sussex, not uncommon. *Mr. Borrer.* About Tunbridge Wells, and Southampton.

Alga arborea, foliacea, orbicularis, diametro bipollicaris.

Thallus arboribus arctè appressus, centrum versus indivisus, et sorediis copiosissimè erumpentibus pulvere albo ubique conspersus, nec rarò obtectus, ambitu foliaceus, lobis perquam brevibus, planis, dilatatis, multifidis, obtusis, vix, aut ne vix, imbricatis, rugulosis, *madefactis* paritèr ac *exsiccatis* super subterque albidis.

Scutellæ nequaquam frequentes, thalli circa medium ortæ, orbiculares, primùm concavæ, et margine sub-clausæ, mox apertæ, et planiusculæ; *discus madefactus* atro-lividus, pruinosus, *exsiccatus* in adultis ater; *margo* crustæ concolor, tenuis, inflexus, crenulatus.

It is now many years since I received specimens of this very beautiful Lichen, collected upon the bark of the *Olea europæa*, near Cadiz, by my friend Don Simon de Roxas Clemente, a most acute Spanish botanist, in honour of whom I have named it. Dr. Acharius has also received it from France; and the only places where it has yet been discovered in Britain being three of the most southern counties, it may fairly be presumed to be a native of the warmer climates; so conspicuous a species not being likely to be overlooked. It is only from the younger and barren plants, and especially from those which grow on flat smooth tiles, that any adequate idea of its elegance can be formed, the frond being in all other circumstances disfigured by the

 powder

powder of the *soredia*, which sometimes wholly cover it. It is quite undivided, and has the appearance of a crustaceous Lichen, except immediately at the circumference, never showing towards the centre the slightest tendency to become lobed, so that its place among the Acharian subdivisions of *Placodium* or *Circinaria* may be considered somewhat doubtful: but, as its nearest affinity is unquestionably with *Parmelia stellaris*, I should have no difficulty in assigning it a place near that species. From this, however, and from all others, the description already given will, I trust, always be sufficient to distinguish it. The smallest figure represents a Spanish specimen.

Parmelia Borreri.

Parmelia thallo membranaceo stellato dilutissimè viridi sorediato, subtus badio fibrilloso; sorediis albis sparsis; laciniis sinuato-lobatis sub-imbricatis margine rotundatis.

Tab. XIII. Fig. 2.

On trunks of trees, especially fruit-trees, in Sussex; not uncommon. *Mr. Borrer.* About Norwich, Coltishall, and Acle.

Alga arborea, sub-orbicularis, diametro bi-tri-pollicaris.

Thallus foliaceus, semper, quantum adhuc vidi, rosulæ in formam expansus, lobatus, lobis distinctis, rarò sibi incumbentibus, vix unquam (ut in *P. saxatili*) ad centrum divisis, sinuatis, dilatatis, semper margine rotundatis; *thallus* arbori, cui innascitur, arctè appressus, marginibus tantùm liberis et erectiusculis, *supernè* glaber, æqualis, neutiquam reticulatus vel lacunosus, et in omni ætatis gradu sorediis exiguis, albis, orbicularibus, per superficiem ubique sine ordine erumpentibus, copiosè notatus, infernè nitidus, fibris nigris, sparsis, raris obsitus: *color thalli*

recentis

recentis supernè tenerrimè viridis, non sine flavedine, *siccati* cinereo-glaucescens, infernè dilute fusco-badius.

Scutellæ visu perraræ, thalli in centro proveniunt, orbiculares, sessiles, *Viciæ sativæ* seminis magnitudine, disco badio, margine thallo concolore, semper, vel in junioribus, inflexo, in vetustis crenulato.

Substantia membranacea, tenuis.

This Lichen, which, though sufficiently plentiful in many parts of Britain, does not appear to have been noticed by any author, was first pointed out to me by my friend Mr. Borrer, after whom I have taken the liberty of naming it. I have lately sent it to Dr. Acharius and Dr. Swartz, both of whom acknowledge it altogether new to them, and a very distinct species. Its appearance is between that of *P. saxatilis* and *P. tiliacea*, but most nearly allied to the former of these plants, from which, especially in a dry state, it sometimes requires careful observation to distinguish them. They generally grow intermixed together, and, when fresh, may be known by their colour, which in *P. Borreri* inclines to a greenish yellow, whereas *saxatilis* constantly has a dull leaden hue. The under side of *P. Borreri* is always much more pale, and but thinly scattered over with those black fibres with which *P. saxatilis* is constantly villous; its mode of growth is in every stage more regularly orbicular, and more closely pressed to the tree on which it grows; the lobes are seldom divided above half way to the centre, and are regularly dilated with rounded apices, instead of being throughout linear and truncated: but what makes the essential character of discrimination between them is, that the *thallus* of *P. Borreri* is every where even, and destitute of those elevated veins so remarkable and so constant in *P. saxatilis*; and that the *soredia*, which in this species are placed upon these veins, as if

from

from their naturally bursting, and which are often confluent to some length, are in *P. Borreri* scattered without order over the whole plant, and sometimes in old specimens so numerous as to cover the whole of it except the tips. The fruit in both is alike, but is produced still more sparingly upon *P. Borreri* than on *P. saxatilis*. *P. Borreri* belongs to that division of the genus *Parmelia*, which Acharius in his *Methodus* has called *Circinaria*, and must be placed between *P. saxatilis* and *conspersa*.

VIII. *An Illustration of the Species of Lycium which grow wild at the Cape of Good Hope. By Sir Charles Peter Thunberg, Knight of the Order of Wasa, Professor of Botany at Upsal, F.M.L.S.*

Read June 17, 1806.

Lycium ad illas plantas, quæ latius territorium occupant, quæ diversa climata ferunt, quæ in utroque hemisphærio telluris inventæ sunt, referendum erit. In Europa boreali et australi, in Siberia, in Africæ variis angulis inque America meridionali species hujus variæ læte crescunt et florent. Facile quidem genus hocce a congeneribus Pentandris distingui videtur corolla imprimis tubulosa fauce intus barbata, atque fructu baccato. Sed variare non raro solet staminibus quatuor, corolla et calyce quadrifidis. Præterea etiam *Serissa* ab hoc ipso genere divulsa nimis consimilis est, sic ut cum *Lycio* affinitate summa jungatur.

Cum vero mihi, sub meis in australi Africa itineribus plures *Lycii* species detegere, et ante detectas ulterius examinare licuerit, in animum induxi, hasce species fusius descriptas et novarum specierum icones pictas illustri Societati Linnæanæ offerre ejusque examini subjicere.

Serissa fœtida imprimis fructu infero dispermo a *Lycio* distincta describitur; hic vero character valde dubius a me in *Flora Japonica* reputatus fuit, quare ego *Lycium japonicum* appellavi, Linnè junior *Lycium fœtidum*, et Retzius *Lycium indicum*. Hæc tamen nota illust. Heretier satis sufficiens fuit

ad

ad novum genus, *Buchozia coprosmoides* dictum et D^no^ Loureiro ad *Dysodam* suam *fasciculatam* inde formandum, licet varie varient et staminum numerus et aliæ floris partes. Sunt itaque *Lycii* species septem, quæ Caput Bonæ Spei patriam suam agnoscunt, licet duæ earum, scilicet *Lycium afrum* et *barbarum* alibi quoque sponte crescant. *Lycii* species sunt vel spinescentes, vel inermes.

LYCIUM.

* *Spinosæ.*

1. L. *barbarum:* foliis lanceolato-ellipticis, ramis laxis.
2. L. *afrum:* foliis lineari-ellipticis, ramis strictis, pedunculis foliis longioribus.
3. L. *rigidum:* foliis linearibus, ramis strictis, pedunculis foliis brevioribus.
4. L. *tetrandrum:* foliis ovatis obtusis, ramis strictis angulatis, floribus subsessilibus, corollis quadrifidis.
5. L. *cinereum:* foliis lanceolatis, ramis teretibus divaricatis, floribus subsessilibus.
6. L. *horridum:* foliis obovatis carnosis, ramis strictis, floribus subsessilibus.

** *inermis.*

7. L. *barbatum:* foliis ovatis, floribus subpaniculatis.

Lycium barbarum.

Lycium barbarum. *Linn. Syst. Veg.* xiv. p. 228. per *Gmel.* Tom. i. P. 2. p. 1059.

Crescit in Carro inter Roggefelt et Bockefeld, florens Novembri, Decembri.

Caulis teres, cinereus, glaber, laxus, erectus.

4 *Rami*

Lycium rigidum

...vies del.t

Rami alterni, similes, divaricati, magis vel minus spinescentes, elongati, laxi, subsimplices.

Folia e gemmis sub spinis, sæpius solitaria, lanceolato-elliptica, integra, glabra, breviter petiolata, aucta, patentissima, sesquipollicaria et ultra.

Flores solitarii, pedunculati, pedunculis capillaribus subpollicaribus.

Lycium afrum.

L. afrum. *Linn. Syst. Veg.* per *Gmel.* t. i. p. 2. p. 1057.

Caulis rigidus, substriatus, erectus.

Rami spinescentes, subverticillati, breves, stricti.

Folia fasciculata, lineari-elliptica, glabra, integra, patula, unguicularia.

Flores pedunculati pedunculis florem æquantibus, foliis duplo longioribus, laxis, capillaribus.

Lycium rigidum.

Tab. XIV.

Lycium rigidum. *Willden. Spec. Plant.* p. 1058.

Crescit prope Urbem Cap. et alibi sparsim, florens Julio et Augusto.

Caulis rigidus, flexuosus, glaber, cinereus.

Rami teretes, flexuosi, stricti, rugoso-angulati, cinerei, divaricato-patuli, apice spinescentes.

Folia fasciculata, linearia, obtusa, integra, glabra, curvata, unguicularia.

Flores solitarii, pedunculati, cernui.

Pedunculi flore et foliis breviores.

Differt ab *L. afro:* floribus imprimis brevissime pedunculatis.

Lycium tetrandrum.

Tab. XV.

Lycium tetrandrum. *Linn. Suppl.* p. 150. *Willden. Spec. Plant.* p. 1058.

Crescit juxta Urbem Cap. inter Leuwe, Staart, et littus maris, Junio florens.

Caulis totus glaber, angulatus, cinereus, rigidus, flexuoso-erectus.

Rami sparsi, similes, patentes, rigidi, nodulosi.

Ramuli similes, horizontales, spinescentes.

Folia fasciculata in ramis et ramulis, ovata, obtusa, integra, lineam longa.

Flores e fasciculis foliorum solitarii, albi, brevissime pedunculati.

Calyx et *Corolla* quadrifidæ cum staminibus quatuor.

Lycium cinereum.

Tab. XVI.

L. cinereum. *Willden. Spec. Plant.* p. 1059.

Caulis teres, striatus, glaber, cinereus, flexuosus, erectus.

Rami alterni, similes, filiformes, elongati, flexuosi.

Ramuli brevissimi, spinescentes.

Folia lanceolata, glabra.

Flores axillares, solitarii, pedunculati.

Pedunculi foliis duplo breviores.

Lycium horridum.

Tab. XVII.

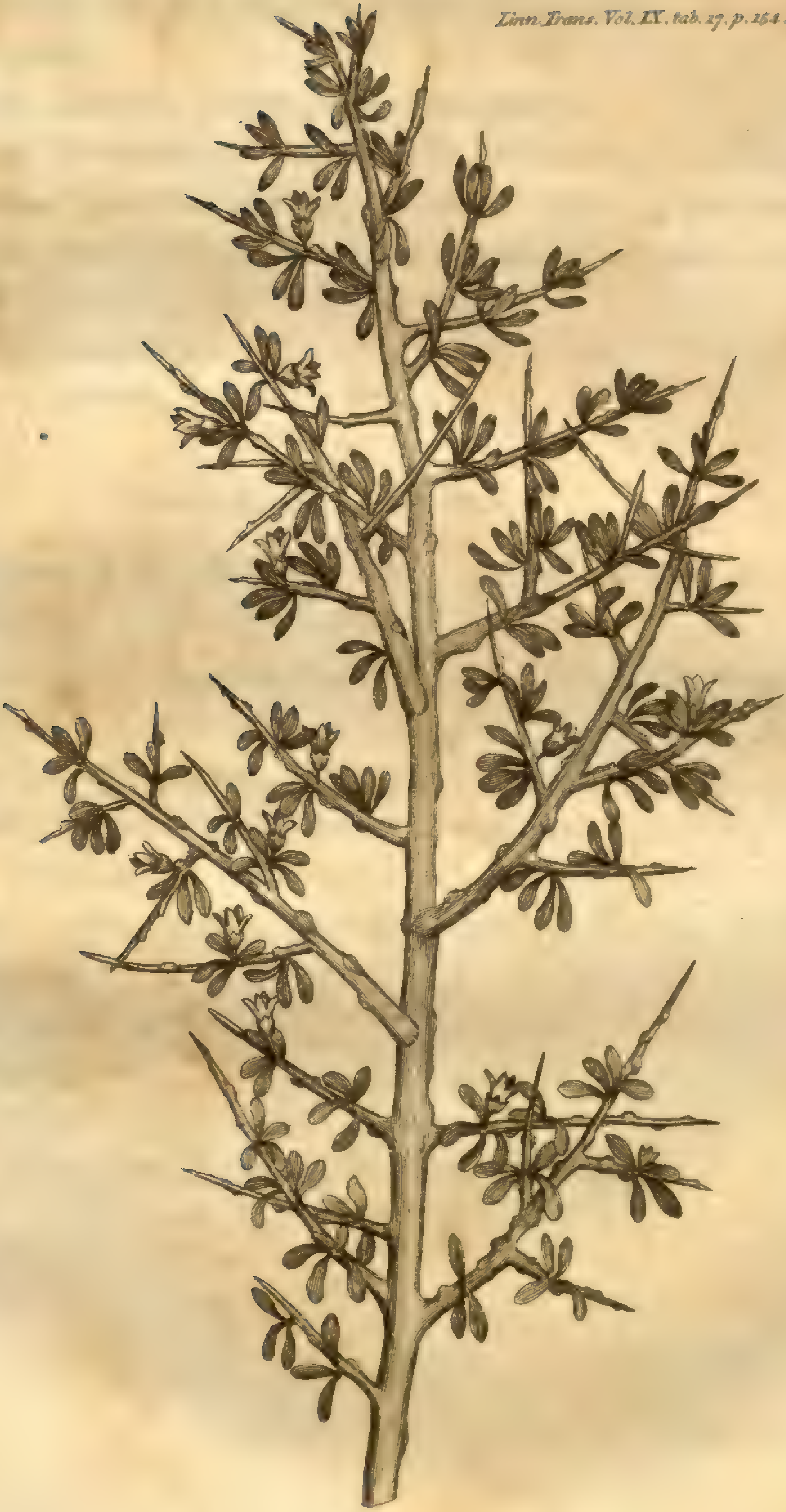
Lycium horridum. *Willden. Spec. Plant.* p. 1060.

[illegible] del.

Lycium tetrandrum.

[illegible] del.t

Lycium cinereum.



Lycium horridum.

Crescit locis maritimis prope Verlooren Valley, Saldahna bay et alibi, florens Septembri, Octobri, Novembri.

Caulis rigidus, teres, fusius, ramosissimus, tripedalis.

Rami similes, sparsi.

Ramuli nodulosi, cinerei, patentes, spinescentes.

Folia fasciculata, 3 usque septem, sessilia, obovata, obtusissima, crassa, carnosa, integra, glabra, patula; supra planiuscula, viridia; subtus convexa, alba linea viridi, inæqualia, semi-unguicularia.

Flores solitarii, pedunculati.

Pedunculus teres, glaber, lineam longus.

Lycium barbatum.

Lycium barbatum. *Linn. Syst. Pl.* xxiv. p. 228. *Suppl.* p. 150. *Spec. Willden.* p. 1060. *Prod.* p. 37.

Crescit in collibus infra montes Urbis Cap. alibique, florens Augusto et sequentibus mensibus.

Caulis fruticosus, totus glaber, bipedalis et ultra.

Rami alterni, divaricati, rugosi, cinerei, flexuosi.

Folia opposita, petiolata, ovata, sæpe acuminata, obtusiuscula, integra, glabra, supra viridia, subtus pallida, pollicaria et ultra.

Petioli unguiculares.

Flores axillares, paniculati.

Pedunculi capillares.

Stipulæ vel Bracteæ albo-ciliatæ.

Bacca didyma, compressa, excisa, bisulca, bilocularis.

 IX. *Some*

IX. *Some Observations on an Insect that destroys the Wheat, supposed to be the Wireworm. By Thomas Walford, Esq. F.A.S. & L.S. With an additional Note, by Thomas Marsham, Esq. Treas. L.S.*

Read April 21, 1807.

THE insect which is the subject of the following memoir has never, I believe, been noticed or described by any entomologist or agriculturist; its depredations are the annual topic of conversation with the latter, yet few know what insect it is that destroys the wheat in the months of October and November, under the denomination of the Wireworm. Many suppose it to be a *Scolopendra*, others a species of *Iulus*, and some the larva of a *Tipula*, or of the *Scarabæus Melolontha* of Linnæus. I supposed it to be one of the above, till I found two insects in the very act of destroying the wheat, as represented in the annexed figure (TAB. XVIII. fig. 3. *a*.). These I believe to be the insects commonly, although very improperly, called the Wireworms in Essex and Suffolk: they appear to me *larvæ* of one of the coleopterous tribe; but to what genus they belong can at present only be conjectured. The projecting jaws somewhat resemble those of a *Lucanus*. The two jointed bristles, and the cylindrical tail, give it an affinity to *Staphylinus*; but the *larva* of that insect is supposed to be carnivorous, and not graminivorous. I fear, therefore, that the genus of this insect cannot be determined till it be traced to its perfect state.

I shall

I shall now proceed to relate the discovery of the insect, and to detail the injury supposed to be done by it.

In October 1802, having occasion to call upon an agriculturist* whose skill and judgement in farming are rarely equalled, he informed me that his green wheat was dying and losing plant very much, the reason of which he could not comprehend. I immediately suspected that it was occasioned by the Wireworm, but what kind of insect it was, I could not inform him. I therefore requested that he would accompany me to the field where the greatest injury was done, in order that we might examine into it. This we accordingly did; and we were successful in discovering three of the insects in question, of which two were in the act of destroying the wheat, as above mentioned. With their projecting jaws these insects cut round the outside grass about an inch below the surface of the soil, to get at the young white shoot in the centre, which they eat: upon this, vegetation is immediately stopped, and the plant dies. I suspect that they first eat the flour in the grains which has not been drawn up by vegetation; for, when we touched them, they ran into the husks; and two of the three insects I carried home in the husks, which appear to be their habitations, and probably the place where they change from the *larva* to their perfect state.

The injury which the public sustains by the ravages of these insects may, in some measure, be calculated from Mr. Olley's loss in 1802: he sowed fifty acres of a clay soil with wheat; out of these ten were destroyed by them, which were replanted by dibbling-in one bushel of seed per acre. The price of wheat at that time was eight shillings per bushel.

We here observe one fifth part of the quantity sown destroyed

* Mr. Thomas Olley, of Stoke next Clare, in Suffolk.

by

by these noxious insects: but the depredations of the Wireworm, as I am informed by a friend* whose experience and observation enable him to calculate with superior judgement, being principally confined to wheat sown upon clover leys, old pastures recently broken up, pea and bean stubbles, &c., we may suppose the general average of the injury to amount to much less than a fifth (Mr. Olley's loss): a twentieth part of what is sown upon this description of lands will, I think, be deemed a very fair and moderate calculation. The number of cultivated acres of land in England at the time above mentioned was computed at seven millions, of which 2,400,000 were calculated to be sown with wheat; and as only one half of the wheat annually sown is supposed to be upon clover leys, old pastures, &c., our calculations must be confined to 1,200,000 acres instead of 2,400,000: this will give 60,000 acres as annually destroyed by the insect in question; which replanted, at one bushel per acre, will require 60,000 bushels of seed, which, at eight shillings per bushel, are worth 24,000*l.* Besides this, although no extra expense is incurred by the farmer in preparing the land, yet he has to pay for dibbling-in the seed, which, at five shillings and threepence per acre, will cost 15,750*l.*, or, at the full price, six shillings per acre, 18,000*l.* If the land requires harrowing, there will be a further charge of ninepence per acre, or 2,250*l.*, not to name other items, which render it difficult precisely to ascertain the loss of the farmer.

If the above calculation be thought a fair one, and I see no reason why it should not, we find the quantity of wheat lessened to the market by the depredations of these insects is very frequently, if not annually, sixty thousand bushels; which oc-

* Allen Taylor, Esq. Wimbish-hall, Essex.

casions

4
1
2
a
b
3
b
8
b
7
6
a
5

casions to the farmers an additional expense of at least 15,750*l.*

I hope these observations will prove a spur to gentlemen more conversant in entomology and agriculture than myself, to excite them to inquire into this subject, the result of which must ultimately be beneficial to the public at large, by discovering some means of preventing the injury done by these mischievous insects. At present we know of no other than early ploughing, which is not always convenient to the farmer, as he wants to feed his clover land as late as the season will admit of. Unslaked lime has been tried without success*; although it is well known, if laid thick upon the land and ploughed in immediately, it will destroy insects of every kind, that are in the soil; but in many places the expense of procuring lime is too great to think of using it in sufficient quantities to answer the intended purpose†.

As the drawing is from the accurate pencil of Mr. Sowerby, no description of the insect is necessary.

EXPLANATION OF THE FIGURES.

Tab. XVIII. *Fig.* 1. The insect, natural size.
2. The same, magnified.
3. *a.* The same, destroying the wheat.
— *b.* Hole in the husk, into which the insect ran upon being disturbed.

Additional

* Farmer's Magazine, page 450.

† I am aware of its being said that part of the injury sustained is done by the grub of

Additional Note, by Mr. Marsham.

THE above described Larva is quite new to me, nor can I find any thing like it in the various authors I have consulted, who have written on the larvæ of insects. I am therefore ignorant to which order it belongs. The name of Wireworm seems to be given to various species of larvæ, but what I consider to be the true Wireworm was sent to me some time ago by the Right Hon. Sir Joseph Banks. A figure of this I have added to the plate (TAB. XVIII. fig. 4.). The history of this animal I found fully detailed in the Stockholm Transactions for the year 1777, by Mr. Clas Bierkander, Vicar of Gothene, near Skara, under the appellation of *Root-worm.* This larva, when full grown, is about seven lines long, very narrow, of a yellow colour, shining, and very hard: the head is brown, with the extremities of the jaws black. The body is composed of twelve joints, on the last of which are two black indented specks. It has six scaly feet on the fore part of the body. Mr. Bierkander observes, that it remains five years in this state before it changes into a pupa, from whence issues *Elater Segetis* of Linnæus. I have frequently found it both in fields and gardens at the roots of divers plants, but never succeeded in bringing it to perfection. The author above mentioned describes four other species of Root-worms; viz. *Musca Segetis, Musca Hordei, Phalæna turca,* and *Tipula oleracea.*

I flatter myself that this valuable Essay of Mr. Walford's will

of the *Tipula* or Crane-fly; but I beg leave to observe that the injury done by the grub is in the spring, and not in October; as many of the flies have not deposited their eggs till the latter end of September, and those that are deposited earlier are few of them hatched before the spring, as was proved by Mr. Strickney, whose pamphlet, entitled "*Observations respecting the Grub,*" is now before me: therefore the depredations of the grub cannot be greatly prior to that time: besides, they are most plentiful in the fly state at the end of September and beginning of October.

 stimulate

stimulate other gentlemen who reside in the country, and who are so materially interested, to enter seriously into a minute examination of the various causes by which grain is so frequently destroyed; so that, by a number of such inquiries and communications, we may at length be enabled to point out a remedy—as every grain of corn that can be preserved in times like the present must be a public benefit.

Mr. Bierkander's papers on the different root-worms, I got translated by a friend; and the translation, with some remarks of my own, was some time since presented to the Board of Agriculture.

THOMAS MARSHAM.

X. *An Account of the larger and lesser Species of Horse-shoe Bats, proving them to be distinct; together with a Description of Vespertilio Barbastellus, taken in the South of Devonshire. By George Montagu, Esq. F.L.S.*

Read November 19, 1805.

MOST naturalists have conceived an opinion that there are two varieties of the Horse-shoe Bat, *Vespertilio Ferrum-equinum*, distinguished only by their size; as such, Gmelin quotes the *major* and *minor* of Schreber.

The larger species only has hitherto been noticed in England. This was originally discovered by Doctor Latham, who communicated it to Mr. Pennant, and he first made it public in his *British Zoology*, where he states it to be found in the saltpetre houses belonging to the powder-mills at Dartford, frequenting those places in the evening for the sake of gnats; and also observed during winter in a torpid state, clinging to the roof. It is described thus: "The length from the nose to the tip of the tail is three inches and a half: the extent fourteen. At the end of the nose is an upright membrane in form of a horse-shoe. Ears large, broad at their base, inclining backwards, but want the little or internal ear. The colour of the upper part of the body is a deep cinereous; of the lower whitish."

Doctor Shaw, in his *General Zoology*, has nearly followed Mr. Pennant, but adds, "There is said to be a greater and smaller variety;

variety; perhaps the male and female: the greater is above three inches and a half long from the nose to the tip of the tail: the extent of the wings above fourteen."

With respect to the smaller Horse-shoe Bat, nothing more appears to be known than that it is inferior in size, but in other respects similar; from which may be inferred that it is very little known, and it has not, to my knowledge, been recorded as indigenous to England. It is therefore with no small degree of satisfaction I have to announce, that it is by no means uncommon in particular situations; and I have the pleasure of congratulating the zoologist, that fortunate circumstances have enabled me to put the long unsettled opinion with respect to these two Bats, beyond all possible doubt; having lately taken a considerable number of both species, in each of which the sexual distinction was evident. But to render the subject more clear and incontrovertible, I shall proceed, by giving a description of the lesser species, and endeavour clearly to define the characteristic distinction between these two very analogous animals. In order, however, to prevent future confusion, I propose that the least of these should be called *Vespertilio minutus*, leaving the other in full possession of the original Linnæan trivial name of *Ferrum-equinum*.

VESPERTILIO MINUTUS.

Length scarcely two inches and three quarters from the tip of the nose to the end of the tail, of which the latter is full three fourths of an inch: extent of the wings nine inches and a half: weight from one dram three grains, to one dram twenty grains.

The colour above is pale rufous-brown, most rufous on the upper part of the head: the nose is surrounded on the top with a broad membrane somewhat in form of a horse-shoe; within

 this

this is a smaller, in which the nostrils are placed; between these are two other small membranes standing a little obliquely, and appearing as valves to the nostrils; behind these stands a much more elevated longitudinal membrane; and further back is another transversely placed, of a pyramidal shape, standing erect behind the eyes; these last are covered slightly with hair, and some long bristles: round the upper lip under the exterior membrane of the nose is a row of minute tubercles, each furnished with a small bristle, equally well calculated to guide the lesser winged insects to the mouth, as the *vibrissæ pectinatæ* observed in several species of birds: the eyes are very small, black, and hidden in the fur: the ears large, pointed, and turned a little back at their tips; their base almost surrounds the opening, but at the outer part in each is a notch, which admits of the fore part of the ear closing within the other as a substitute for a valve so common in most other species, but of which this is destitute.

It is now many years since I first noticed this species of Bat in Wiltshire; once, in particular, I recollect to have seen a great many taken in the winter over the hollow of a baker's oven, having got in through a small external fissure. In the year 1804, about the latter end of the month of May, I observed several in an old building at the verge of a wood at Lackham, in the same county, erected for the shelter of cattle. In this shaded dark abode, surrounded by lofty oaks, it is not unusual to see several adhering to the plastered roof by their hind claws; and when approached, generally crawling a little to one side, and showing signs of uneasiness by moving their heads about in various directions, but not seeming inclined to take flight till they have been repeatedly disturbed.

At this time I had not been fortunate enough to discover the

haunt

haunt of *Vespertilio Ferrum-equinum;* but my wishes have since been amply gratified, by taking nine of the *V. Ferrum-equinum,* and seven of the *minutus,* many of which were conveyed home alive: of the former there were four males and five females; of the latter five males and two females. Of the *V. Ferrum-equinum* the largest and smallest were both females, one preponderating four drams and a half, the other not exceeding four drams. The length of these to the setting on of the tail two inches and a half; to the end of the tail three inches and three quarters: the expansion of the wings about fourteen inches and a half.

In colour these two species are perfectly similar, except in some instances the sides and breast of the *V. Ferrum-equinum* are more of a ferruginous-brown.

With respect to the face, which is so extremely curious, there appears on a cursory view scarcely a perceptible difference, except that the upper lip of the *V. Ferrum-equinum* is much more tumid; but the most material distinction is in the formation of the nasal membranes, especially that which is posterior and transverse. To explain this no words can convey what a simple outline will, and therefore the curious are referred to TAB. XVIII. *fig.* 5. which represents the side view of the membranes of *V. Ferrum-equinum,* of which *a* is the posterior transverse one; the front is seen at *fig.* 6. The same views are given of the nasal membrane of *V. minutus* at *fig.* 7. and 8, where *b b* represent the membranes in different points of view. In these a very striking difference is observable, and it will also be perceived that the anterior longitudinal membrane is by no means similar in both species.

With respect to the teeth, it will be observed that the *V. Ferrum-equinum* possesses two minute distant fore teeth in the upper

jaw,

jaw, which are not to be found in the *V. minutus*; a circumstance that seems to have escaped most naturalists, this genus being usually placed in the division destitute of upper fore teeth: the canine teeth are also much stronger in proportion in *V. Ferrum-equinum* than in the other species.

Linnæus, when he placed the Bats in the first order of *Mammalia*, doubtless considered the whole genus to agree in possessing two pectoral teats, and no others; and that opinion seems to have been confirmed by succeeding naturalists as far as treading in the path of so great a physiologist may be considered as a proof of the fact. It must, however, be acknowledged that we should do well, if, at the same time we admire the wisdom and consummate skill of others, we were to recollect that circumstances do not always concur to throw all the light upon a subject that might be desired, and that the wisest and most skilful philosopher is not proof against mortal fallibility.

Those who are in the habit of searching minutely into the secrets of nature, well know how necessary it is to be cautious in admitting of general rules.

That the appearance of two pectoral teats in the Bat genus, without any others contiguous, should lead to a conviction that they were the only papillæ such animals possessed, may easily be conceived; but chance frequently develops what the most scrutinizing eye has sought for in vain.

While I was searching for some curious insects which were observed to move with unusual celerity amongst the fur of these Bats*, the pectoral papillæ of one of the *V. minutus* were very conspicuous by the space round them being bare, as if the animal had recently suckled its young; and to my utter astonishment, on turning the fur over in every direction, I discovered two other

* *Celeripes Vespertilionis,* a newly discovered insect.

teats

teats very near together, situated on the lowest part of the abdomen, close to the *pubis.* It may readily be imagined that so unexpected a discovery scarcely admitted the senses to determine the validity of ocular demonstration; the aid, however, of glasses left no doubt of the fact, and a scientific friend confirmed my opinion. At the moment of this discovery I had emboweled all the specimens of *V. Ferrum-equinum,* and consequently cannot determine whether they are similarly formed or not; nor have I since procured a female Bat of any other species to examine, so that it yet remains to be ascertained whether this structure is peculiar to one or more species, or that the two abdominal papillæ are really essential to the generic character of these animals, but hitherto overlooked, by being so far removed from the others. On future observation must depend the place to which the Bats should be properly consigned in the systematic arrangement of quadrupeds. If some species only are found to possess four papillæ, it would be a very considerable violence to nature to divide them on that account; and yet to retain them undivided in the order of *primates,* according to the Linnæan definition, would be inconsistent: but on this part of the subject there is no necessity of enlarging until we become more enlightened.

It is probable the papillæ of all the smaller Bats are so contracted, except at the time of administering nourishment to their young, that they are not discoverable with the utmost attention, for even in the *V. Ferrum-equinum* no pectoral teats were to be discovered, although the sexual distinction was sufficiently evident But this very contracted state of those parts, when nature has no demand for the use assigned to them, is not peculiar to these volant quadrupeds, since we find the same difficulty in discovering them in mice.

These Bats were taken in a large cavern near Torquay in Devonshire,

vonshire, commonly known by the appellation of Kents-hole, and where both species are usually observed in considerable abundance clinging to the vaulted roof of the interior apartments. This vast cavern was explored with a view to obtain whatever species of *Vespertilio* might inhabit it, and with expectation of procuring specimens of *V. Barbastellus*, and possibly some new species, having been informed the cave abounded in number and variety. Strange, however, as it may appear, not a single instance occurred of any other species becoming an inhabitant of this dark and frightful region.

It should therefore appear that these two Bats are as congenial in their animal temperature, as they are similar in habit; and that in constitution they essentially differ from all the other British species.

It is well known that all places impervious to light, and destitute of a free circulation of air, can neither be suddenly heated nor suddenly cooled by the changes of atmospheric temperature, and that the vicissitudes of such a climate are extremely small: thus these species from instinct seek those dark and dreary abodes, and wholly retire from the face of day, their feelings being repugnant to the benign influence of the solar rays, which vivifies and reanimates all nature besides.

The *V. Noctula*, *murinus*, *auritus*, and probably *Barbastellus*, whose constitutions appear more robust, do not retire into total darkness, nor wholly remove from the vicissitudes of the surrounding atmosphere; but, being formed by nature to bear a greater degree of either heat or cold, content themselves with such a hybernaculum as is sufficient to protect them equally from the extremes of one or the other. Thus we find these in the fissures of old buildings, in towers, under the eaves of houses and churches, and in the hollows of trees, and not unfrequently

congregated;

congregated; but they seldom or never enter those gloomy regions which nature has consigned to the others as an exclusive right of inheritance.

Contemplating the frolics and evolutions of these little creatures in our summer evenings perambulations, must bring to recollection the extraordinary opinion of some philosophers, who scarcely admit their progressive motion to be an act of flying. How little can such have attentively observed their sudden and rapid turns in pursuit of flies! It might be fairly asked, How much inferior are the aërial excursions of a Bat to that of a swallow, one of the most powerful on wing of the feathered tribe? and might we not pronounce, without risk of refutation, that a Bat far surpasses the greater part of birds in its powers of flight?

If we are to give the utmost credit to the experiments of Spalanzani and M. de Jurine, the conclusion would be, that vision is not of any apparent use to these animals, since they fly about with as much ease, and equally avoid obstacles, when their eyes are covered, or even put out, as they do previous to that operation. That their eyes, being minutely small, are not calculated to admit many rays of light, as in most nocturnal birds, must be allowed, but then they have no occasion to distinguish their prey at a distance. If it be denied that their eyes are of any use in the discerning of objects against which they might strike, surely they must be equally useless in discovering the smaller winged insects on which they prey in the dusk of the evening.

Can we, however, meditate on the wonderfully rapid turns and evolutions of these creatures in pursuit of their prey, and not allow them the powers of sight to effect the first principle of life, a power not denied to any known animal possessed of a red

circulating fluid by the arterial system? To assent to the conclusion which M. de Jurine has drawn from his experiments, that the ears of Bats are more essential to their discovering objects than their eyes, requires more faith, and less philosophic reasoning, than can be expected of the zootomical philosopher, by whom it might fairly be asked, Since Bats see with their ears, do they hear with their eyes? It will not be sufficient for these experimentalists to inform us that the copious auricles of this class of animals, or their delicate internal structure, are adequate to the double purpose of seeing and hearing, when we perceive that they are by nature provided with organs of sight similar to what we not only feel most sensibly to be the most inestimable of blessings, but also perceive to be the principal fountains of locomotion in all other animals in the same scale of beings.

Although it cannot be admitted that the Almighty hand gave to these creatures those most wonderfully constructed organs of sight, without endowing them with visual properties, yet it must be allowed that there is something extremely astonishing and unaccountable in their unembarrassed flight in total darkness, whether by sealing up their eyes, or by their natural habits, of finding their way through all the smaller passages and windings, into the inmost recesses of their subterraneous abode. By what occult property they direct their course in total darkness, is perhaps a problem of as difficult solution as that of a swallow returning from the torrid to the frigid zone, to breed in the same nest it had prepared the preceding year, and in which it had performed those functions of nature. Can any human understanding develop the cause that so unerringly directs the carrier-pigeon to its place of nativity, when previously taken to the distance of five hundred miles? How is the bee instructed

to

to find its hive when captured and taken to a distance? This is inexplicable, and yet no one will dispute the fact. Indeed the practice is common in some countries, in order to find the wild hives; for if two bees are taken near the same spot, and turned out at different points, distant from each other a few hundred yards, if belonging to the same hive, the two lines formed by the direction of their flight will discover the hive to be at the intersection of those lines. These are the mysteries of nature, so impenetrable to the human mind, that we are lost in a labyrinth of wonder at such instinctive endowments, which are incomprehensible to our limited faculties. We have only attentively to examine the operations of nature, and we shall find a thousand instances not less astonishing than that the Bat should find its road without one single ray of light to direct its course*.

VESPERTILIO BARBASTELLUS.

Gmel. Syst. i. *p.* 48. *Buffon.* viii. *p.* 130. *t.* 19. *f.* 1.
Pennant Quadr. ii. *p.* 561. *Shaw Zool.* i. *p.* 133.
Brit. Miscellany, t. v.

This species has long been known to be an inhabitant of some parts of the European continent, especially France, but, I believe, had not been discovered to inhabit England till the year 1800, when I first noticed it to be indigenous to the south of Devon, and had prepared an account of it for the Linnean Society. Since that period others have occurred in the same

* Since the preceding account was written, several of both these species of Bats have been collected from the same cavern, and in one of the *V. minutus* the abdominal papillæ were more conspicuous than in the former; but not the least vestige of such could be found in the *V. Ferrum-equinum:* it should, however, be remarked, that in these the pectoral teats were equally invisible.

 county;

county; and we are informed in the *British Miscellany*, that it has been taken in the powder-mill at Dartford in Kent.

The figure and description given in that work are highly satisfactory; but as it is a newly discovered quadruped in this island, and of course little known, it may not be uninteresting to give some additional description of it from specimens in my possession, and to make such further remarks as may conduce to its natural history.

The first I obtained was taken on wing in the village of Milton, which is situated near the coast, and, I believe, was a female.

The colour of this is a dusk-black, intermixed with a few gray-brown hairs towards the rump: the membranes of the wings and tail dusky.

On the 17th of August 1805, I procured a male specimen alive; it was found adhering to a small tree near Kingsbridge.

The length is nearly four inches, of which the tail measures one inch seven eighths; the extent of the wings about eleven inches: weight exactly one hundred grains.

The colour differed a little from that of the former, especially in having the middle of the back and the breast mixed with silvery-gray hairs; the lower belly, thighs, and behind the vent on the tail membrane more gray. The nose is rounded in front, flat, and cavernous on the top, in which part the nostrils are placed: ears large and black, furnished with a linear valve, and unusually broad at the base, extending forwards, and meeting over the nose, so as to cover the forehead: eyes very small, seated within the membrane of the ear: the teeth numerous in both jaws, and much jagged; in the upper, four cutting teeth, but no canine, and a vacant space between those and the grinders: in the lower jaw six cutting teeth, and four canine or longer teeth, and between these last on each side is a small inter-

mediate one; these longer teeth fall into the vacant space in the upper jaw.

Buffon appears to be the first naturalist who recorded this species, and his account of it has been copied by succeeding writers.

It seems to partake of the habits of the common Bat; but it may be readily distinguished from *Vespertilio murinus*, even on wing, in the earlier part of the evening, by its superior size, and in being by far the darkest in colour of all the British Bats. Upon comparison, the flattened nose, more pointed ears, and particularly the base of these coming so forward on the forehead as scarcely to leave any space between, will be found essential characters of distinction.

I have not been able to discover the hybernaculum of this species, but it is reasonable to believe its torpid state is passed in similar situations to those in which all but the *V. Ferrum-equinum* and *V. minutus* retire during the colder months; none of which appear to be subterraneous.

XI. *De-*

XI. *Description of two new Species of Didelphis from Van Diemen's Land. By G. P. Harris, Esq. Communicated by the Right Honourable Sir Joseph Banks, Bart. K.B. Pres. R.S. H.M.L.S.*

Read April 21, 1807.

Didelphis cynocephala.

Didelphis fusco-flavescens supra postice nigro-fasciata, caudâ compressâ subtus lateribusque nudâ.

Tab. XIX. *Fig.* 1.

The length of this animal from the tip of the nose to the end of the tail is 5 feet 10 inches, of which the tail is about 2 feet. Height of the fore part at the shoulders 1 foot 10 inches—of the hind part 1 foot 11 inches. Head very large, bearing a near resemblance to the wolf or hyæna. Eyes large and full, black, with a nictitant membrane, which gives the animal a savage and malicious appearance. Ears rounded, erect, and covered with short hair. Black bristles about 2 inches long on the upper lips, cheeks, eyebrows, and chin. Mouth very large, and extending beyond the eyes. Cutting teeth small, obtuse, 8 in the upper jaw, and 6 in the lower. Canine teeth 2 in each jaw, strong, 1 inch long. Twelve molares in the upper jaw and 14 in the lower, of which the four hindmost are trifurcate. The legs are short and thick in proportion to the length of its body. Fore feet 5-toed, claws black, short, and blunt, with a callous naked heel. Hind feet 4-toed, claws short, covered by tufts of hair extending 1 inch beyond them, with a long

G P Harris del.

long callous heel, reaching to the knuckle. Tail much compressed, and tapering to a point, covered with short smooth hair on the upper part; sides and under part bare, as if worn by friction; not prehensile. Scrotum pendulous, but partly concealed in a small cavity or pouch in the abdomen. Penis projecting behind: glans forked.

The whole animal is covered with short smooth hair of a dusky yellowish brown, paler on the under parts, and inclining to blackish gray on the back. On the hind part of the back and rump are about 16 jet-black transverse stripes, broadest on the back, and gradually tapering downwards, two of which extend a considerable way down the thighs.

On dissecting this quadruped, nothing particular was observed in the formation of its viscera, &c., differing from others of its genus. The stomach contained the partly digested remains of a porcupine ant-eater, *Myrmecophaga aculeata.*

The history of this new and singular quadruped is at present but little known. Only two specimens (both males) have yet been taken. It inhabits amongst caverns and rocks in the deep and almost impenetrable glens in the neighbourhood of the highest mountainous parts of Van Diemen's Land, where it probably preys on the brush Kangaroo, and various small animals that abound in those places. That from which this description and the drawing accompanying it were taken, was caught in a trap baited with kangaroo flesh. It remained alive but a few hours, having received some internal hurt in securing it. It from time to time uttered a short guttural cry, and appeared exceedingly inactive and stupid; having, like the owl, an almost continual motion with the nictitant membrane of the eye.

It is vulgarly called the *Zebra Opossum, Zebra Wolf,* &c.

DIDELPHIS URSINA.

D. nigra maculis raris albis, auriculis calvis, caudâ subprehensili subtus nudâ.

Tab. XIX. *Fig.* 2.

This new species of Opossum is likewise an inhabitant of Van Diemen's Land, where it burrows in the ground, and preys on the smaller quadrupeds, &c.

Length from the tip of the nose to the end of the tail 2 feet 2 inches, of which the tail is 8 inches, and the head 6. Height from the fore heel to the top of the shoulder 9½ inches. From the hind heel to the rump 7 inches $\frac{7}{10}$ths. Head flat, and somewhat triangularly shaped. Distance from the nose to the eyes 2½ inches; between the eyes 2¼ inches. Ears rounded, naked. Eyes small, dark brown. Mouth large: 8 small cutting teeth; 2 strong canine ones three quarters of an inch long, and 8 grinders in the upper jaw; 6 cutting teeth, 2 canine, and 10 grinders in the lower jaw. Bristles over the eyes 6; on each side the nose 13 long, and several short ones; on each cheek 17 pointing backwards, and two tufts of 15 each under the chin pointing downwards. Fore feet 5-toed; inner toe shortest, claws sharp. Hind feet 4-toed, claws sharp, with tufts of hair extending half an inch beyond them. Heel long and callous. Tail slightly prehensile, its under part bare.

The whole head, body, legs, and upper part of the tail are covered with long coarse black hair, irregularly marked with one or two blotches of white; in some specimens on the shoulders, in others on the throat or rump.

The male is larger than the female, and has the scrotum pendulous, and the penis projecting behind. The female is furnished with the abdominal pouch, and brings forth four or five young

ones

ones at a time, which, like the rest of this genus, are small, naked, and blind, adhering firmly by their mouths to the teats.

These animals were very common on our first settling at Hobart Town, and were particularly destructive to poultry, &c. They, however, furnished the convicts with a fresh meal, and the taste was said to be not unlike veal. As the settlement increased, and the ground became cleared, they were driven from their haunts near the town to the deeper recesses of forests yet unexplored. They are, however, easily procured by setting a trap in the most unfrequented parts of the woods, baited with raw flesh, all kinds of which they eat indiscriminately and voraciously; they also, it is probable, prey on dead fish, blubber, &c. as their tracks are frequently found on the sands of the sea shore.

In a state of confinement, they appear to be untameably savage; biting severely, and uttering at the same time a low yelling growl. A male and female, which I kept for a couple of months chained together in an empty cask, were continually fighting; their quarrels began as soon as it was dark (as they slept all day), and continued throughout the night almost without intermission, accompanied with a kind of hollow barking, not unlike a dog, and sometimes a sudden kind of snorting, as if the breath was retained a considerable time, and then suddenly expelled. The female generally conquered. They frequently sat on their hind parts, and used their fore paws to convey food to their mouths. The muscles of their jaws were very strong, as they cracked the largest bones with ease asunder; and many of their actions, as well as their gait, strikingly resembled those of the bear.

 The

The specimen from which the drawing was made was a very fine male, in the possession of Lieutenant Governor Collins, and was put on board the Ocean transport, as a present to Sir Joseph Banks, but died before the vessel left New South Wales.

Its vulgar name is the *Native Devil.*

XII. *De-*

XII. *Description of a new Species of Dimorpha. By Edward Rudge, Esq. F.R.S. and L.S.*

Read May 5, 1807.

THE genus *Dimorpha* (*Parivoa*, Aubl.) having been adopted by Willdenow from Schreber, and selected in his Elements of Botany as an example of a rare and uncommon fructification, along with Aublet's figure and specific name of *grandiflora*, I am induced to lay before the Linnean Society a figure and description of the real *D. grandiflora*, which I trust will illustrate this beautiful genus more satisfactorily than it has been hitherto done.

This species, from its corresponding in all respects with Aublet's description of his *grandiflora*, I imagine to be the plant meant under that name by him. His figure appears to belong to his second species, confounded with a very different plant.

I am indebted to the researches of my friend Mr. Salisbury for the detection of this mistake in Aublet's work; and I am confirmed in this opinion by finding, upon examination of the original specimen in Sir Joseph Banks's herbarium, that the plant figured in Aublet's tab. 304, does not belong to the genus Dimorpha. Specimens of that shrub in flower, collected in Guiana, and now in my possession, prove it to be a species of Cyclas.

Dimorpha grandiflora.

D. foliolis 2-jugis (an pluribus?) parum acuminatis, vexillo plusquam 2-pollicari valde convoluto, filamentis inferne vix pubescentibus.

Tab. XX.

Sponte nascentem in *La Guiane* ad fluviorum ripas legit J. Martin. Floret *Septembri.*

Arbor trunco crassitie hominis, 30 pedes alta vel plus: ligno rubro solidoque: Rami juniores cinerei cum tuberculis et punctis multis albidis, teretes.

Folia alterna, abrupte pinnata: *Petioli* basi incrassati, glabri: Petioluli crassiores quam petiolus, glabri: Foliola in omnibus nostris exemplaribus 2-juga, inferius forte 3—4-juga, ovato-lanceolata, latere interiore sæpius parum angustiore, integerrima, parum acuminata, inferne evidenter marginata, utrinque glabra, superiora majora: *Nervi* tenues.

Stipulæ 2, petiolo ad basin insertæ, late auriculares, versùs flores repente majores, ni fallor persistentes vix enim inferiores minores esse squamas gemmaceas credam.

Flores racemo brevi ex axillis ultimis penultimisque.

Pedunculus crassitie pennæ corvinæ, a basi mox in ramulos alternos sæpius 2-floros decompositus, glaber. *Pedicelli* basi apiceque articulati.

Bractea ad basin singulorum ramorum pedicellorumque decidua: 2 aliæ juxta apicem pedicelli alternæ, sed ita approximatæ ut alia aliam amplectetur, semiorbiculares, obtusæ, extus tomentosæ, persistentes.

Torus $2\frac{1}{4}$ lineas longus, obconicus basi cylindraceâ, extus tomentosus, intus infra insertionem calycis petalorumque callo 7-lobo crasso abunde mellifero vestitus.

Calyx

Dimorpha grandiflora.

CALYX toro confluens, 4-phyllus: *Foliola* uno latere imbricata præter intimum quod utroque in cunabulis obductum, oblonga, integerrima, obtusa, extus tomentosa, intus lævia, 2 lateralia angustiora: tandem deciduus.

COROLLA in tribus floribus uno nondum expanso, quos in aquâ tepidâ emollitos accuratiori examini subjeci 5-petala, margine tori inserta et omnia distincta: *Vexillum* paulo plus quam 2 pollices longum vel in siccis circa genitalia convolutum instar labelli Limodori Tankervilliæ margine repandum, certe obtusum nec emarginatum: *Alæ* minimæ circiter unam lineam longæ, auriculares: *Carina*, ni fallor, penitus 2-petala, alis structurâ similis sed etiam minor.

FILAMENTA 10, 9 in vaginam longam fere glabram coalita, decimum distinctum et basi incrassatum, supra basin iterum dilatatum.

ANTHERÆ ellipticæ basi 2-fidâ, apice emarginulatæ, faciem versus dehiscentes.

PISTILLUM. *Germen* stipitatum, circiter 4 lineas longum, rhombeo-ovale valde compressum, glabrum: *Stylus* longitudine et situ filamentorum longiorum, glaber: *Stigma* videtur truncatum.

PERICARPIUM non vidi, sed in germine semina 6 adsunt.

EXPLANATION OF THE PLATE.

Tab. XX. *Fig.* *a.* The calyx of its natural size.
b. The stamina.
c. The pistillum, magnified.
d. The front and back of an anther, exceedingly magnified.

XIII. *Some*

XIII. *Some interesting Additions to the Natural History of Falco cyaneus and pygargus, together with Remarks on some other British Birds. By George Montagu, Esq. F.L.S.*

Read May 5, 1807.

FALCO CYANEUS.

Ind. Orn. i. *p.* 39. 94.

Hen Harrier. *Lath. Syn.*

THAT the natural history of a bird indigenous to this country, and by no means uncommon, should have so long continued in obscurity, must, to those not in the habit of investigating nature, appear very extraordinary; but the scrutinizing ornithologist will recollect how few opportunities occur of proving, or controverting, a generally received opinion by ocular demonstration. Upon the present subject the mind of the scientific world has been so extremely oscillatory for want of proof, that most authors have related the opinions of others, or reasoned from concurring circumstances, blended with parole evidence. In fact, it must be confessed, that although I had many reasons for believing the Hen Harrier, *Falco cyaneus*, and Ringtail, *Falco pygargus*, to be the same species, yet I could not adduce any well-authenticated proof that this was really the fact, when the *Ornithological Dictionary* was published. It is true that I was assured by a most worthy and scientific clergyman in Sussex, that the gamekeeper of General Prescott, in whose neighbourhood he

he resided, had actually shot both these birds from the same nest, and that they had both been preserved in one case, and were in the General's possession. That my friend gave implicit credit to the keeper's assertion I could not have the least doubt; but as I had been assured from another quarter, that not only the male and female Hen Harrier had been shot, which belonged to the same nest, but that the young which could just fly were also killed, and were of the same cinereous-gray colour as the parent birds; Who, perplexed with such opposite assertions; could determine? But, to close this discordancy, I shall transcribe a passage from the latest publication on ornithology exclusively, that has appeared in this country, except the Second Supplement to the General Synopsis. The author's words are these: "It has been supposed that this and the following (relating to the two birds in question) are male and female; but the repeated instances of Hen Harriers of both sexes having been seen, leave it beyond all doubt, that they constitute two distinct species."

Such a strong unqualified assertion appearing on public record, stamped with the authority of the author without reference to the nature of the proof, should seem to proceed from personal knowledge; and as the only positive proof to be obtained in such case is by dissection, it might naturally be presumed that the author had really determined this long desideratum by the knife.

That male Ringtails have frequently occurred has been well and repeatedly authenticated, but no well attested fact of a female Hen Harrier is, I believe, to be found. Those who have formed their own opinions upon this subject will not readily adopt that of another, without direct and incontrovertible proof; and since there are two opposite opinions founded equally

upon

upon pointed assertions, it will not be allowed by one party that both the *F. cyaneus* and *F. pygargus* having been shot at the same nest, is a direct proof of their being the same species. Nor, on the contrary, will the other be convinced of the fact by a bare assertion that female Hen Harriers have been observed ; for it may be said, that as birds of prey plunder the nests of others, one of these birds might be shot in that act of depredation. And the circumstance of a single instance of a female bird appearing in the habit of a Hen Harrier, may be disputed as equally liable to objection, since instances have not been wanting to prove that female birds have occasionally assumed the male plumage. Such difficulties could only be removed, and the fact indisputably established, by finding the nest, and rearing the young; and I am happy in being now enabled to lay before the Society the result of an experiment of this nature, which must bring all controversy to a conclusion. To a member of this Society, the Rev. Mr. Vaughan, we are greatly indebted, as the discovery might yet have been protracted to a series of years, but for his kind communication and essential aid towards the development of the subject.

About the latter end of June, in the year 1805, my friend informed me that his servant had found the nest of a Hen Harrier in some furze, which contained three young, and an addle egg ; at this time the infant birds were very small, and only covered with white down : it was therefore determined to take them as soon as we deemed them sufficiently large to be brought up by hand : when that period arrived, the servant was directed to shoot one, and if possible both of the old birds, previously to his bearing away what was considered a prize of no small value.

On the return of the man with the young, he brought with him also the Hen Harrier, which he assured us he had under con-

cealment

cealment in the furze, shot in the act of dropping a thrush into the nest, while the female (as he seemed to consider the other, and which he described to be a brown hawk) was covering the young. He afterwards shot at and wounded the female, but could not obtain it.

Strong as this person's evidence was in our own minds, yet it conveyed no more to the public mind than what had been so repeatedly asserted on similar authority: being, however, in possession of the aerie, the means were in our power of fully determining the point in question; and to enable me to observe and note the changes that might take place in the plumage, I undertook the care of the whole brood.

At this time the two largest had thrown out many feathers, sufficient to discover the plumage of the Ringtail approaching; the other, by its appearance, must have been hatched much later. In about a month it was evident from size, that there was but one male, so that all my hopes rested upon this single life. As they became full feathered, there was at first no distinction in plumage, but the eyes of the supposed male were always lighter than in the others, whose irides were so dark as not to be distinguished at a small distance from the pupil. In the dress of the Ringtail the whole continued through the winter, when the one which had been weakly from the first, died; this circumstance induced me to force a premature change in some of the quill and tail feathers of the others, fearing some accident might frustrate my earnest desire of bringing matters to a decisive proof; and about the middle of June I was highly gratified by discovering an appearance of the new feathers in the place of those which had been plucked out, and that clearly evinced the smallest bird to be a Hen Harrier, and the larger to be a Ringtail.

Thus I had compelled nature to declare her secrets before the

 appointed

appointed time; for in every other respect their plumage was yet similar, excepting about the sides of the face, which were paler in colour in the former, in which also the irides were of a dull yellow, somewhat mottled, whereas in the latter they still continued dark.

The shyness of these hawks had occasioned their breaking most of their larger feathers, although confined in a place ten feet in length by five in width; and as their regular moulting season was advancing, they were turned into a garden surrounded by a wall, where, after some time, the female died of the cramp in her legs.

The male had about the 20th of July thrown out many of the new feathers naturally, especially the greater coverts of the wings, and a few gray feathers in different parts of the body. On the 20th of August, the greater part of the quill and tail feathers were grown to their full length, and a gradual increase of gray feathers appeared on most other parts: the eyes also became more orange, but it was not till the middle of October that it had attained that state which made it desirable to retain, as an existing fact of the change; it was then killed, and is now in my museum. In this state the plumage of the Ringtail or female still remains about the neck, the smaller coverts of the wings, the thighs, and part of the belly, intermixed with the male plumage: the top of the head and wreath have also a mixture of the feathers of both sexes: the quills, scapulars, and tail, are completely masculine; in the last of these there are a few small broken bars of cinereous-brown on a white ground, in the three outer feathers, the exterior margins cinereous-gray; the six middle feathers are almost wholly gray, and the markings are very obscure beneath.

Having by the most powerful evidence traced this bird from the egg to that state approaching maturity, which so clearly and

 satisfactorily

satisfactorily proves that *Falco cyaneus* and *pygargus* are actually of the same species, two queries arise out of the observations of different authors. It has been remarked by Doctor Latham, that no author has mentioned the Hen Harrier as a bird of the American continent. Do the females only migrate to those particular parts where they have been observed, after the breeding season; or is not the transatlantic Ringtail a distinct species, not differing in sexual plumage? The other query is with respect to the sexual distinction of the Ash-coloured Falcon of the *Orn. Dict.* which has been considered to be most probably the Northern Falcon, or *Falco hyemalis*; for although the male of this species has only occurred to me, yet, nothing having been related by any author to induce a belief that the sexes are essentially different in plumage, may we not reasonably conjecture that the female *F. hyemalis* has been mistaken for a *F. cyaneus*, and possibly occasioned some of the accounts related, concerning the similitude in the plumage of both sexes of the latter? Indeed the *F. hyemalis* has generally been described to be considerably larger than those males which have come under my inspection, a circumstance serving to strengthen the opinion that the sexes are similar in plumage, (the females of this tribe being always the largest,) and may have been confounded with the *cyaneus*, as was the case of the two specimens which were sent to me.

From the account here given of the Hen Harrier, it is quite clear that the change of plumage is effected in the autumn after it leaves the nest; and as it is between three and four months in the act of moulting, it is certainly very extraordinary that so few instances have occurred of its being killed in that state which might have been decisive. That such has been taken is evident by the description of *Falco Hudsonius* of authors,

thors, which is doubtless this bird in change of plumage; and it will be observed, that mention is made in the *Ornithological Dictionary* of some slight indication of such a change; one had only a few gray feathers, beginning the change, and another had several brown feathers in the smaller coverts of the wings, which now appear to be the last that are changed.

I have now only to remark that the nest of this bird was composed of sticks rudely put together, was nearly flat, and placed on some fallen branches of furze that supported it just above the ground. The addle egg found in the nest is little inferior to that of the Moor-Buzzard, and similar in shape and colour, being spotless, but of a sullied white.

FALCO CINERAREUS.

Ash-coloured Falcon. *Orn. Dictionary.*

By the examination of a recent specimen of this bird killed on the 10th of August 1803, near Kingsbridge, in Devonshire, I am enabled to add somewhat to the description of it, and to correct a mistake in the work above referred to, which I trust will not be unacceptable to the ornithologist.

It weighed nine ounces and three quarters: length eighteen inches; breadth three feet eight inches and a half; length from the elbow to the end of the third quill feather, which is the longest, fifteen inches and a half; length of the tail from the gland on the rump nine inches and a half. Bill black, the base and cere greenish: irides and eyelids bright yellow: crown of the head, cheeks, throat, under part of the neck, and upper breast dark ash-colour: upper part of the neck, back, and scapulars

cinereous-

cinereous-brown; the latter is cinereous at the base of the feathers with the tips brown: the smaller coverts are marked in the same manner as the scapulars; the greater coverts are cinereous-brown, the exposed part of each feather darkest, but not tipped like the others: the eight prime quills are dusky-black, the last with a dash of cinereous; the first is very short, the third by far the longest: secondary quills cinereous-brown above, pale beneath, with three remarkable dusky-black bars across them, nearly in parallel lines, each half an inch in breadth; one only of which is to be seen on the upper side of the wing, the others being hid by the coverts, this is about two inches from the tips of the feathers; on the under part of the wing two of these bars are very conspicuous, the other close to the base is much paler, and hidden by the under coverts, the first row of which is white, with a large dusky bar across their middle; the rest are bright bay, more or less spotted, barred, or margined with white: the under parts of the body, including the under tail coverts and thighs, white, with a broad streak of bright bay down the shaft of each feather: under scapulars with broad alternate bars of bay and white: the tail is somewhat cuneiform, the two middle feathers dark brown, or dusky, the rest dark ash-colour, palest on the two or three outer feathers, which have also their inner webs approaching to white; all except the two middle have four equidistant bars on the inner web, taking in the shaft; these on the two outer feathers are bay, the rest more or less dusky, with a ferruginous tinge on those at the base: legs orange yellow, rather long and slender: claws small black.

In the original description of this species*, taken from a cased specimen, the greater coverts are, by mistake, said to

* Ornithological Dictionary.

have

have dusky-black on the outer webs towards their middle, forming a small bar; whereas it will be now observed, this visible bar on the wing above is on the secondary quills, and not on the coverts.

The bird from which the above description is taken is a male: it has the feathers behind the ears short, but no ruff continued round the head, as in the Hen Harrier. It was in good condition, and had in its stomach a sky-lark, and yet its weight was not so much as that of the Hen Harrier by three or four ounces; though its length and breadth are much superior, by reason of its long wings and tail. It must also be remarked that it appears to be at least a year old bird, as some of the quills are moulting; the first and second feather of the secondary quills in each wing are not full grown, but are of the same colour as the rest, and possess the same three bars.

I am not enabled to offer any thing further on the synonyma than what has been given in another place; it differs a little, it is true, from the *Falco hyemalis**; but when it is considered how little that species seems to be known, some allowance must be made for want of a more minute description: there seem, however, some marks of such near affinity, that I trust it will hereafter be found the same. Whether this is migratory with us is not at present to be fully determined; the time of the year in which this was shot is rather too early to induce a belief that it is a winter migrant; and the only one besides that which has come under my inspection I think was killed in November, which indicates a winter residence with us. It is, however, more probable that this species may be indigenous to us, and that it has frequently been mistaken for a variety of the Hen Harrier.

* Latham's Synopsis.

SYLVIA

Sylvia Dartfordiensis.

Ind. Orn. ii. *p.* 517. 31.

Dartford Warbler. *Lath. Syn.*

In a paper which I had the honour to lay some time since before the Linnean Society, some notice was taken of the discovery of this little bird in the southern parts of Devonshire: and I there remarked that, as it had been so frequently observed to be a winter inhabitant, a circumstance not favourable to its being a migrative species, (as it was said to breed in Provence on the continent so much further south*) I was not without hopes of ultimately proving it indigenous to this part of England.

My opinion that this species of Warbler bred with us, was greatly strengthened by a letter which I had the pleasure of receiving from a scientific friend in Cornwall, well known in the literary world†, who assured me that his brother had observed these birds for several years to inhabit furze, near Truro; that last year, as well as the present, they were plentiful during the summer season; and that he had not only seen them every month in the year, but had observed young ones soon after they had left the nest, though his search for the nest and eggs had been in vain.

This information redoubled, if possible, my ardour, and I visited a large furze common in my neighbourhood, where I had seen several the preceding autumn; and upon close search on

* Provence is situated between 33 and 34 degrees north latitude, and 5 and 7 east longitude; and therefore, as these birds have been also found in England in latitude 51, and west longitude 5, there can be no doubt but all the intermediate space, taking in nearly the whole of France, is inhabited by them more or less, whenever the situation is congenial to their habits.

† Mr. Stackhouse, of Pendarvis.

the

the sixteenth of July, three pair of old birds were observed, two of which had young evidently by their extreme clamour, and by frequently appearing with food in their bills. The boldness and excessive garrulity of one pair induced me to believe that the nest was near at hand; but it was not without two hours strict attention to the actions of the parent birds, that I discovered a single young one on the ground; this appeared to be too small to voluntarily leave the nest, which was probably within a few feet, but which, from the almost impenetrable thickness of the surrounding furze, I was not successful in discovering.

On the 17th my researches were renewed, and after three hours watching the motions of another pair, I discovered the nest with three young; it was placed amongst the dead branches of the thickest furze, about two feet from the ground, slightly fastened between the upright or main stems, not in a fork.

On the same day, close to where I found the single young bird, two were observed to be busied, carrying materials for building; and by concealing myself in the bushes, I soon discovered the place of nidification, by the continued returns of the birds with something in their bills, for making their nest; and, upon examination, I found it was just begun. Extraordinary as it may appear, there is great reason to believe that this was the same pair from which I had the day before taken the single young one. Is it not possible that the inclination of the parent birds to propagate again, was the cause of the young leaving the nest prematurely, in defect of a sufficient supply of food, and that the other young perished? A circumstance so singular can no more be denied than positively asserted; but as I could never observe more than one pair near the place, there is reason to believe, though extraordinary, that it was really the case, and that

they actually began a new nest the day after they were deprived of the only surviving young.

The nest appeared to be finished on the 19th, but it possessed only one egg on the 21st in the afternoon, and on the 26th it contained four, when the nest and eggs were secured.

This nest was placed near the top of the furze, in the thickest part, about four feet from the ground, but so well concealed that, although the birds were repeatedly seen to fly in with building materials in their bills, it was with the greatest difficulty found. The continued flirting of these birds from bush to bush, and through them, is so extremely deceitful, that it is scarcely possible to notice the spot, amongst such an uniformity of cover, where they deliver the contents of their bill, especially as they frequently retire from a very different part.

Like the other, this nest is composed of dry vegetable stalks, particularly goose grass; mixed with the tender dead branches of furze, not sufficiently hardened to become prickly; these are put together in a very loose manner, and intermixed very sparingly with wool. In one of the nests was a single partridge's feather. The lining is as sparing, for it consists only of a few dry stalks of a fine species of carex, without a single leaf of the plant, and only two or three of the panicles.

This thin flimsy structure, which the eye pervades in all parts, much resembles that of the whitethroat. The eggs are also somewhat similar to those of *Sylvia cinerea*, but rather less, weighing only 22 grains; like the eggs of that species, they possess a slight tinge of green; they are fully speckled all over with olivaceous-brown and cinereous, on a greenish-white ground, the markings becoming more dense, forming a zone at the larger end.

 Whether

Whether the Dartford Warbler usually breeds so late, is not at present to be determined; but as I found two pairs with young at the same time, and have great reason to believe another pair was sitting about the same period, it is reasonable to conclude that they do not propagate very early,—or how are we to account for the loss of the first nests of all these, for there were no young birds to be found flying amongst the furze?

I shall now return to the young birds, which I considered as no small treasure: the first, which was found on the ground, had been three days in my possession before the others were fit to take*, and then being able to fly a little, was put into a nest of chaffinches, and placed in a box; and so much did he like the warmth, that he rested perfectly contented, and though he would for several days after fly up to the top of the box to be fed, yet he retired as soon as satisfied with food, and cuddled amongst his companions.

By experience, grasshoppers, which at this season of the year are to be procured in abundance, are found to be an excellent food for all insectivorous birds; these, therefore, at first were their constant food, and after five or six days a mixture of bread, milk, chopped boiled meat, and a little finely pounded hemp- and rape-seed, made into a thick paste, was sometimes given, to wean them from insect food by degrees; this they became more partial to than even grasshoppers, but they afterwards preferred bread and milk with pounded hemp-seed only, to every other food, the smaller house or window flies excepted.

Before these birds left the nest I put them into a pair of scales, and found the four weighed nine drams, which on an average is

* There is an exact period of age which is the best for rearing young birds by hand, this is when the tips of the quills and the greater coverts of the wings expose a portion of their fibrous ends.

two

two drams and a quarter each. At this time they collectively ate in one day upwards of five drams of grasshoppers, which is one dram and a quarter each, so that in two days each consumed more than its own weight. Such a repletion is almost incredible, and doubtless greatly beyond what the parent birds could usually supply them with, which by observation appeared to consist of variety, and not unfrequently small phalenæ: their growth, however, was in proportion to this large supply of food.

This interesting little family began to throw out some of their mature feathers on each side of the breast about the middle of August, and the sexes became apparent. At this time they had forsaken their grasshopper food, feeding by choice on the soft victuals before mentioned.

The nestling attachment is very conspicuous in these little birds towards the dusk of the evening, for a long time after they have forsaken the nest; they become restless, and apparently are in search of a roosting place, flying about the cage for half an hour, or until it is too dark to move with safety, when a singular soft note is uttered by one which has chosen a convenient spot for the night, at which instant they all assemble, repeating the same plaintive cry. In this interesting scene, as warmth is the object of all, a considerable bustle is observed, in order to obtain an inward birth, those on the outside perching upon the others, and forcing in between them: during this confusion, which sometimes continues for a few minutes, the cuddling note is continually emitted, and in an instant all is quiet.

Nothing can exceed the activity of these little creatures; they are in perpetual motion the whole day, throwing themselves into various attitudes and gesticulations, erecting the crest and tail at intervals, accompanied by a double or triple cry, which seems to express the words *cha, cha, cha*. They frequently take their food suspended by the wires, with their head down-

 wards,

wards, and not unusually turn over backwards on the perch. The males, of which there were three out of the four, began to sing with the appearance of their first mature feathers, and continued in song all the month of October, frequently with scarce any intermission for several hours together: the notes are entirely native, consisting of considerable variety, delivered in a hurried manner, but in a much lower tone than I have heard the old birds in their natural haunts. This song is different from any thing of the kind I ever heard, but in part resembles most that of the stone-chat.

The Dartford Warbler, like the Whitethroat, will sometimes suspend itself on wing over the furze, singing the whole time; but is more frequently observed on an uppermost spray, in vocal strain for half an hour together.

Buffon, who appears to have been the first and perhaps the only person on the continent who knew any thing of the Dartford Warbler as a naturalist, seems to have known very little more than the bird itself, and that it had been found in Provence, (as his name evinces,) but nothing of its habits. If he had not figured it in *Pl. enl.* 655. *f.* 1, it would scarcely be conceived that the history given by that author could be intended for this species. We must therefore conclude that he, like other great men, was deceived in that part of its natural history related by M. Guys of Marseilles, from whom he seems to have collected, that this bird not only feeds amongst cabbages on the smaller lepidopterous insects, but that it roosts amongst their leaves, to secure itself against the *Bat*, its enemy.

To this curious account, implicit faith cannot be given; for as on the continent furze is by no means uncommon, except in the more northern part, there can be no reason to believe the nature of this little creature to be so different in Provence from what it is in England, where it is only found to inhabit the more

extended

extended tracts covered with that shrub. If indeed it were necessary to hide itself at night from the *Bat*, furze is better calculated for that purpose than cabbages; but I believe there is no species of that genus in Europe sufficiently large to attack even our most diminutive bird, the golden-crested wren, which we may safely conclude has no occasion to hide itself from any European species of *Vespertilio.*

Science, unfortunately, is too frequently blended with fiction, occasioned by too large a share of credulity; the detection of such errors is a work of time, and a series of years are often required to correct what, according to the general merit of an author, has more or less been stamped with credit.

Experience from ocular demonstration has at last been able to collect materials concerning the natural history of *Sylvia Provincialis,* which serves to evince that M. de Buffon was misled, and that, in fact, little was known of the habits of this elegant little Warbler till the present discoveries.

BIRDS NEWLY DISCOVERED IN GREAT BRITAIN.

In this place I shall take the opportunity of recording some birds which, as far as I have been able to discover, have not till recently been found in this kingdom, but now claim a place in the British Fauna.

ARDEA ÆQUINOCTIALIS.

Ind. Orn. ii. *p.* 696. 70.

Little White Heron. *Latham. Syn.* v. *p.* 93. *No.* 63.

This bird was killed in Devonshire the latter end of October, in the year 1805, and is now in my museum. Upon dissection it proved a female.

TANTALUS

Tantalus viridis.

Ind. Orn. ii. *p.* 707. 15.

Green Ibis. *Lath. Syn.* v. *p.* 114. 13.

This species was shot in the interior part of Devonshire about the middle of September, in the same year as the preceding: it is a male, and occupies a place with the last.

Whether this, the Bay, and the Glossy Ibis are specifically distinct, admits of doubt, and requires further investigation.

Scolopax noveboracensis.

Ind. Orn. ii. *p.* 723. 32.

Red-breasted Snipe. *Lath. Syn.* v. *p.* 153. 26.

A small flock of these extremely rare birds made their appearance on the coast of Devon in the spring of the year 1803, one of which was shot in my neighbourhood, and is now in my museum. Soon after, I received information that a similar bird had been shot at Weymouth, in company with several others; and the skin of another was sent to me, which had been killed at Sandwich in Kent; probably belonging to the same flock, as the account of the number seen last on the east coast tallied nearly with what first was noticed in the west, allowing for those which are stated to have been shot.

Glareola austriaca.

Ind. Orn. ii. *p.* 753. 1.

Austrian Pratincole. *Lath. Syn.* v. *p.* 222. *t.* 85.

A bird of this species has been shot, at or near Liverpool

in

in Lancashire, and is now in the museum of Lord Stanley. Having been informed that a publication will soon make its appearance wherein not only the particulars relative to the capture of this bird will appear, but also a very excellent figure, I shall forbear to anticipate the author's intention.

XIV. *An*

XIV. *An Account of some new Species of Piper, with a few cursory Observations on the Genus. By Mr. John Vaughan Thompson. Communicated by the Right Honourable Lord Seaforth, F.R.S. and L.S.*

Read June 2, 1807.

Of this extensive and highly natural genus a less intimate knowledge is in general possessed by the European botanist than of most others in which so many plants of interest occur. This circumstance is to be attributed not only to the plants of this genus being all natives of tropical climates, but also to the very strong resemblance of most of the shrubby species to each other, and the impossibility of preserving, by the usual methods, such as are herbaceous and succulent. To obviate this difficulty attending the investigation of the species of the latter description, I had proposed, when in the West Indies, to make drawings of all that I should meet with; but my professional occupations prevented me from carrying this intention into execution so completely as to enable me as yet to lay them before the public. Among the sketches at that time made are the two which accompany this paper, and which, the species appearing to me as nondescript, I conceived might not be unacceptable to the Linnean Society.

Throughout this family the inflorescence is disposed in a scaly spike, or, more properly, a catkin; in most of the species close

and

and imbricated, but in others, particularly the herbaceous species, more open and lax. The flowers, separately examined, consist of an inferior scale, a roundish germen, and two stamina, without the least vestige of a calyx or corolla*. There is no style, but three minute stigmata not easily distinguishable by the naked eye, and the anthers are for the most part sessile; but I cannot be led to think that the filament is entirely wanting in any of the species. Notwithstanding the obvious simplicity of this structure, an attempt has been made in the *Flora Peruviana* (amongst a variety of others) to form the herbaceous species into a new genus, under the name of *Peperomia*. Where this rage will stop it is impossible to predict; and I conceive it to be the duty of every disciple of Linnæus to oppose such innovations, as they cannot fail to produce obscurity and confusion where all was nature and simplicity. The least possible deviation in any one particular must now be considered sufficient to authorise the formation of a new genus; and even the slightest difference of habit alone is frequently thought to afford ample reason for these arbitrary separations. In the present instance, to say more would be to allow that there were grounds for such a change where none really exist. I shall therefore content myself with giving the diagnostic characters, as submitted in the *Flora Peruviana*, and shall leave every person to decide for himself, confident that no true botanist will dissent from my opinion.

"Differt hoc genus a *Pipere* Linn. spathis ovatis, minimis: prominentia minima sub flosculis singulis; staminibus germine longioribus: stigmate puncto unico minimo, vel macula."

* In Woodville's *Medical Botany* a representation of *Piper nigrum* is given, with an *imaginary* dissection of the *corolla*, directly in opposition to the description which accompanies it.

 The

The anomalies necessarily occurring in extensive genera, when properly understood, are to be considered as affording great helps to the inquiries of the practical botanist. In the genus now under consideration they may be made eminently useful: thus, for instance, it may be divided into two sections; the first containing the shrubby species, the other the herbaceous, both of which may be further subdivided into—1st, Such as are erect; and, 2dly, Such as creep or climb, in the following manner.

*a * Fruticosa, erecta.*

Piper Amalago, reticulatum, aduncum, &c.

** * Fruticosa, scandentia.*

Piper nigrum, longum, &c.

*b * Herbacea, erecta.*

Piper acuminatum, pellucidum, alpinum, &c.

** * Herbacea, repentia.*

Piper glabellum, obtusifolium, nummularifolium, &c.

It may be worthy of remark that the individuals of the first section are common to both continents, those of the second are confined exclusively to the old, and those of the two last principally to the new.

The species herewith presented belong to the last section, and are all so very strongly and distinctly marked that they cannot fail to be at all times easily discriminated.

Piper quadrangulare.

Tab. XXI. Fig. 1.

Piper herbaceum, caule quadrangulare radicanti, foliis oppositis rhombeis, pedunculis axillaribus solitariis, spicis binatis.

Habitat

Jn.º T. Thompson del.

Habitat in insula Trinitatis.

I observed this plant nowhere but on the trunk of an old tree, on the road between St. Joseph's and the Caroni River.

Piper bracteatum.

Tab. XXI. Fig. 2.

Piper herbaceum, caule filiformi radicante, foliis cordato-orbiculatis acuminatis obtusiusculis, pedunculis axillaribus solitariis bracteatis, spicis brevibus.

Habitat in insula St. Vincentii.

Found in some abundance on the rocks and trees on the eastern side of Morne Suffrier, about 2000 feet above the level of the sea. It approaches most near to the *P. scandens* of Vahl, but is sufficiently distinct.

Piper hernandifolium.

Vahl. Enum. Plant.

Piper herbaceum, caule radicante, foliis ovato-acuminatis peltatis, pedunculis oppositifoliis solitariis articulatis.

Habitat in insulis Caribbæis.

I first discovered this plant in the mountainous woods of St. Vincents, in 1800, and subsequently in the woods of Trinidad and Granada.

 XV. *An*

XV. *An Inquiry into the Structure of Seeds, and especially into the true Nature of that Part called by Gærtner the Vitellus. By James Edward Smith, M.D. F.R.S. P.L.S.*

Read November 3, 1807.

Gærtner, so justly celebrated for his anatomical and physiological inquiries into the nature of Seeds in general, and for his particular illustration of One Thousand different kinds, claims the merit of first giving a name and definition to a part called by him the *Vitellus*, which, though not entirely unobserved by preceding philosophers, had received no particular description nor explanation. Before we enter upon the investigation of this organ, it is necessary to consider the structure and functions of the parts of a Seed in general; and this it will be best to do physiologically.

Three agents are necessary to the germination of seeds,—moisture, heat, and air. A seed committed to the ground absorbs, through the vessels of its base, the juices of the soil, or any other moisture that comes in its way; while it receives, throughout its whole substance, a definite portion of heat, some seeds requiring a greater share of the latter, for the purposes of vegetation, than others. Moisture and heat however are not of themselves sufficient to cause the germination of seeds. It has long been known that air is equally necessary; and modern chemists have ascertained oxygen gas to be the particular ingredient of the atmospheric air which is requisite, and which is absorbed by seeds, in

in the moments of incipient germination, from or through the surrounding soil. Thus the bulk of the seed is increased, and its vital principle stimulated. It bursts its immediate integument, or *testa,* and in the first place sends forth the radicle, or young root, into the ground. This part being, as Dr. Darwin well observes, most susceptible of the stimulus of moisture, elongates itself in the direction in which it meets with that stimulus; and descending into the earth, while it fixes the infant plant, assumes its own proper function of imbibing nourishment for the future support of that plant. But before any supplies can be thus obtained, considerable demands are made, even by the root itself; and not only an evolution of parts, but likewise an increase of bulk, takes place in the young vegetable. For this necessary purpose a store is prepared in the *Albumen,* a substance either constituting a separate body by itself, as in grasses, corn, palms, &c., which, from a hard, dry and tasteless mass, changes, by the action of water and oxygen, into a milky or saccharine fluid; or the same substance is lodged in, or united with, the bulk of another part, next to be mentioned, the Cotyledon, or, as they are generally of the plural number, Cotyledons. As the root is the part stimulated by moisture, the Cotyledons appear to be most stimulated by air, and they consequently raise themselves, for the most part, out of the ground in order to receive it, in the form of seminal leaves, well known to perform, for a time, the functions of real leaves, and even, by the action of light, to assume their green colour. The *Albumen* cannot be said to be stimulated, or acted upon as a living body, by the air or gas, which only produces chemical changes in it; and the destination of this substance being soon accomplished, it disappears by absorption. Not so the other parts of the seed, one of which becomes the still descending root, the other

other the nurse, or, if we may say so, the foster brother of the young ascending plant, which last originates from the extremity of the embryo opposite to the root, but always, like that, most intimately connected with the Cotyledons. These indeed, sooner or later, wither away; when the acquisition of real and more ample foliage renders them superfluous, or no longer necessary. But all Cotyledons do not ascend out of the earth, nor assume any of those functions of leaves in which light is concerned. In the Horse Chesnut, the *Cyamus Nelumbo*, the *Tropæolum majus*, and some other plants, they always remain buried, no doubt acted upon by the air or gas alone. Even in plants of the same natural order, *Papilionaceæ*, some, as *Lupinus*, raise their Cotyledons into the air and light, in the form of very conspicuous green seed-leaves; while others, as *Lathyrus*, retain them under ground, concealed in the black skin of the seed, quite out of the reach of every ray of the latter. In these we know a farinaceous *Albumen* is lodged, whether they rise into the light or not; and the closest analogy leads us to conclude that their functions are otherwise similar, which can only be with respect to air. Even Cotyledons however are not indispensably requisite to a seed, though the Albumen appears to be, in some form or other, necessary to all seeds. Not to mention the tribes of vegetables allowed or guessed to be without Cotyledons, and thence, for systematical convenience, denominated acotyledonous; all, who have sufficiently considered the matter, know that in those called monocotyledonous, what is vulgarly taken for the Cotyledon is really an Albumen, a part fundamentally distinct in functions from what is proper to a Cotyledon. Thus even so conspicuous a family of plants as the *Orchideæ*, which the faithful Jussieu confesses were only presumed from analogy to be monocotyledonous, or, as he guardedly expresses it, to

have

have "a single-lobed *corculum*," have been shown by Mr. Salisbury, in the 8th volume of our Transactions, the only person I believe who has well examined their germination, to have in fact an Albumen, but no Cotyledon at all. Nor does such ambiguity or uncertainty belong to this family alone. Many plants are presumed to be monocotyledonous, chiefly because they grow in the water; and it is much to be regretted that this fundamental principle of all natural systems should in many cases be so ill-established, and very often so extremely difficult to detect or to determine; which happens in general where its help is most wanted, as I shall presently endeavour to show; but I must first speak of the more immediate object of the present essay.

Gærtner asserts the *Vitellus* of seeds to be "distinct from the "Cotydelons as well as from the Albumen, and, for the most "part, situated between the latter and the Embryo." He considers as its principal diagnostics the 3 following characters: "1st, that it is most closely connected with the Embryo, so as "not to be separable from it without injury to its own substance: "2dly, that notwithstanding this intimate connection, it never "rises out of the integuments of the seed, as the Cotyledons "usually do, in germination, so as to become a seminal leaf, "but, rather like the Albumen, its whole substance is destroyed "by the seedling plant, and converted into its own nourishment: "and 3dly, that if the Albumen be likewise present, the *Vitel-"lus* is always situated betwixt that and the Embryo, in such a "manner, however, that it may be separated from the Albumen "with great ease and without injury." For which reasons this able writer considers the organ in question as "allied on the one "hand to the Albumen, on the other to the Cotyledons," but truly distinct in nature from both. He proceeds to observe that

"it

" it is of all the internal parts of a seed the most singular, and " by far the most unfrequent."

Now, to consider all these points separately, in the 1st place the *Vitellus* is not more closely connected with the Embryo than the greater part of Cotyledons are; according to the figures and descriptions of Gærtner himself, the fidelity of which must be evident to any one in the habit of using his book, and especially to those who will take the trouble of comparing a few of them with the seeds to which they refer, while in the earliest stage of germination, at which time the relative connection of the parts is best ascertained. 2dly, That the *Vitellus* never rises out of the ground, is a circumstance common to it with many Cotyledons, allowed to be such by Gærtner, as in the leguminous plants, and others already mentioned. 3dly, That the *Vitellus* is situated between the Albumen (if the latter be present as a separate organ) and the Embryo, is only a necessary consequence of the more intimate connection between it and the latter than either of them has with any other part, which is also precisely true of the Cotyledons and Embryo, as above mentioned. For these reasons I presume the *Vitellus* to differ in no respect from the subterraneous Cotyledons already described; and that its office is to perform the necessary functions relative to air or oxygen, till the leaves come forth and assume those functions, in greater perfection, with the cooperation of light. This seems more satisfactory than the opinion of Gærtner, that the organ under consideration affords nourishment to the Embryo; because this is abundantly supplied by the copious *Albumen* of a multitude of seeds whose *Vitellus* is very inconsiderable, as grasses; and because it is unphilosophical to recur to two causes, when one is evidently sufficient. In fact, the *Vitellus*, as far as I can observe, only dwindles away when the leaves unfold,

fold, exactly as happens to the subterraneous Cotyledons. The same thing very often takes place as speedily in those which rise out of the ground; the existence of the latter appearing to be prolonged in some instances, merely by their nearer approach to the nature of leaves, as in Umbelliferous and Cruciform plants. The difference of duration is still more evident, and more instructive as to our present purpose, in the Leguminous family, between such Cotyledons as rise above the ground, like Lupines, and those which remain buried, like Vetches, the latter decaying as quickly as any supposed *Vitellus* can do. In Grasses the scale, taken by Gærtner for a *Vitellus*, is mostly so thin and unsubstantial, as not possibly to contain any material portion of nourishment; but its expanded figure is very well calculated, like that of the leaves, for functions analogous to vegetable respiration, and its whole aspect conveys the idea of a primary or subterraneous leaf, quickly rendered superfluous by the production of real leaves, which, as well as the radicle, are probably, in the first stage of their evolution, fed by the abundant juices of the Albumen. It appears that the pretended *Vitellus* is not necessary to all plants furnished with this distinct kind of Albumen. The Palms and *Orchideæ* prove to be destitute of it. On the other hand, I can find no instance of a supposed *Vitellus*, and a real Cotyledon or Cotyledons, in the same plant. What Gærtner terms the Cotyledons of *Rhizophora*, in his *tab.* 45, appears to me to be the *Plumula*, and in his descriptions of some of the *Scitamineæ*, he evidently takes the latter for a Cotyledon.

By understanding the *Vitellus* as a Cotyledon, all ambiguity respecting the component parts of any seed is removed. When the Cotyledons are two or more, the only question is whether the albuminous matter is lodged in their substance, or whether it

it forms a separate organ. When the Embryo is accompanied by a simple undivided organ or seed-lobe, we know it to be a Cotyledon by its strict union, or even partial incorporation, with the Embryo, as in *Zamia**; whereas the pure separate Albumen of the true Palms has, as in every other instance, no more connection with the Embryo, according to Gærtner's just remark, than is absolutely necessary; and moreover evinces its true nature by the chemical alteration, and speedy absorption, of its whole substance. The Cotyledon, as I consider it, of *Zamia*, as in numerous parallel instances, shrivels and shrinks indeed considerably, from the absorption of its albuminous contents by the vegetating Embryo, but does not disappear, leaving only a skin behind, like the Albumen of grasses or corn, because that part of its substance which is destined to perform the office, essential to a Cotyledon, concerning air, merely decays when its end is answered. It may further be observed upon this subject, that the albuminous matter of seeds with two or more Cotyledons is commonly of an oily nature, while those with one Cotyledon or none at all, have a more farinaceous, or even stony, Albumen. Still the latter changes to a milky or oily fluid, previous to its absorption. When the vital principle of a seed is extinct, its albuminous oil becomes rancid, and, even in seeds that retain life, is liable to suffer some deterioration by keeping. Hence, as Darwin observes, gardeners preserve Melon and Cucumber seeds, perhaps for years, that the plants they produce may be less luxuriant, in consequence of being starved at their first germination; for any injury to the Cotyledons, even after they

* Mr. R. Brown, who has observed the germination of a large species of *Zamia* in New Holland, assures me that he found no such incorporation of the parts in question as Gærtner has represented in his *t.* 3, and that the structure and evolution of every part bore an exact resemblance to *Cycas* as described by M. Aubert du Petit Thouars.

begin

begin to rise above ground, is found to cramp the subsequent growth of the plant. The oil of the Cotyledons has been usually supposed a protection to their internal parts, I presume against wet; but this purpose it by no means does or can answer, for all seeds readily absorb moisture whenever they meet with it, and, if likewise exposed to the action of oxygen, they vegetate, in whatever situation they may otherwise happen to be. I suspect moreover that the oily and mucilaginous fluids of seeds in general, before they perform their office in germination, all previously become milky, and often saccharine, from the actions of water and oxygen. It might be worth while to inquire, whether exposure of such seeds as are most prone to turn rancid, to a quantity of oxygen, would tend to preserve them. It is, I believe, found that the admission of some atmospheric air is necessary to the preservation of many seeds. The primary cause of decay therefore in seeds spoiled by keeping may originate, not, as I have supposed, in the extinction of their vital principle, but in the corruption of their albuminous oils; and this is strengthened by the experiments of the French chemists, whose applications may much more readily be supposed to correct and restore the albuminous juices, than to bring the dead to life.

This idea of the albuminous matter, whether oily, mucilaginous or farinaceous, being, when not a distinct and separate body, always lodged in the Cotyledons, throws additional light on the nature of the last-mentioned parts, and in a very beautiful manner confirms their analogy with leaves. The discoveries of Mr. Knight have proved that the nutritious fluid or sap of plants is carried into the leaves, in order to be there acted upon by air, light, heat and moisture. After these agents have produced their effects, the fluids are sent back, through the returning vessels, into the branch or stem, to furnish matter of increase

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to the whole vegetable body. The chemical experiments, of Dr. Priestley more especially, confirm this, by teaching us that carbonic-acid-gas is absorbed by leaves in the day-time through their upper surface, and decomposed by them, its carbon being added to the sap, and its oxygen emitted by the under surface. In the dark, leaves are found to absorb oxygen. Let us apply all this to the germination of seeds. The oxygen, known, as I have already said, to be necessary to this process, being conveyed to the seed in its dark subterraneous situation, is absorbed by its Cotyledons, already stored, from the constitution of the parent plant during their formation, with albuminous matter abounding with the carbonic principle. The chemical action of the oxygen on this albuminous substance, renders the latter a more or less saccharine, and, with the addition of the imbibed moisture, a milky fluid, fit to be transmitted, through the returning vessels of the Cotyledons, into the stem of the Embryo, especially as all these important parts have already begun to swell by the absorption of moisture assisted by warmth. Hence we see why light is found hurtful to incipient germination, and why carbonic-acid-gas may be given out by seeds at that period. We perceive also why the outside of seeds is so commonly dark-coloured, or even black, as in *Canna*, *Afzelia*, and others, it being the only part of the vegetable body, as far as I recollect, that is ever positively black, except perhaps the skins of some fruits. It is, moreover, evident that all the indispensable functions of the Cotyledons are best performed under ground, and that when they rise into the air and light, it is not till after their primary destination is fulfilled, and then because, being fundamentally of the nature of leaves, they are also capable, in most instances, of assuming their functions with respect to light. It is highly worthy of notice that, in consequence of the original

position

position of the Cotyledons in all seeds, the oxygen gas must always be imbibed by their under side, that very same part which in leaves gives out this kind of gas during the day, and probably absorbs it during the night. It would have evinced a strange contrariety in the constitutions of two organs otherwise so analogous, I mean the leaves and cotyledons, if the *upper* surface of the latter, while in the unexpanded seed, had been presented to receive the oxygen gas. Where there is a separate Albumen, without any perceptible Cotyledons, it is probable that the stalk of the Embryo may answer the necessary purpose; just as the stems of leafless plants must be presumed to perform the usual chemical functions of leaves, though we cannot ascertain in what direction the different airs are imbibed or discharged, there being no decided upper or under surface in such stems, any more than in ensiform leaves. Such, however, are rare exceptions, which if not, as yet, found to throw any new light on the subject, certainly do not overturn any important part of the above hypothesis. That some part, immediately connected with the Embryo, must be stimulated in order to excite the germination of a seed, this phænomenon being dependent on the vital principle, is evident. I conceive that, when present, the Cotyledon or Cotyledons are themselves stimulated by the oxygen gas, or rather by the heat which chemists inform us is produced by the absorption of that gas, so as to set their fluids in motion, and thus to propel the young root and rising *Plumula.* But when the Cotyledons are wanting, the Embryo may very well be conceived capable of sufficient action to imbibe for itself the juices of a distinct Albumen, already become milky and saccharine by the reception of oxygen and moisture, by which merely chemical process, as in barley, so considerable a degree of heat is evolved, as must

very

very powerfully excite the vital principle of the budding vegetable. In the few cases where one or more Cotyledons and a distinct Albumen are together present, it does not seem necessary that the gas should act through the former upon the Albumen, the two organs being but little connected, and its operation on the latter being independent of all vital or organic laws; but either the gas itself, or the heat produced, may very well so stimulate the vital principle of the Cotyledons, as to propel their fluids into the Embryo and assist germination. This opinion is the more probable, as those fluids must be supposed more truly of the nature of sap, and more immediately fit for the use of the infant plant, than the liquor of the Albumen. However this may be, the existence of a Cotyledon or Cotyledons, together with a separate Albumen, in seeds, seems to me so unusual, as not to occasion much difficulty, and I would define a Cotyledon to be a vital organ, capable, as such, of being stimulated by oxygen, heat, or both, for the propulsion of its contents; while such an Albumen is merely a repository of nutritious vegetable matter, subject to the laws of chemistry alone, and only passively resigning those contents to the absorbing powers of the Embryo, to which it is attached.

I must now, under the impression of what has just been advanced, return to the arrangement of plants by their Cotyledons.

Plants in general are Dicotyledonous, having a pair of these organs, which commonly rise out of the ground; but if they do not, it appears, from the consideration of the Leguminous tribe, that such a difference could scarcely serve for a generic distinction, much less for that of a Class or Order. It also appears that, if the number of Cotyledons exceeds two, as in *Pinus* and a few other instances, the difference is of little or no use for systematical purposes, and of no physiological importance whatever.

ever. The Cotyledons of *Pinus* all present their backs to receive the oxygen.

Some plants appear to be really furnished with one simple Cotyledon, as *Zamia*, and according to Gærtner's figures and descriptions, the true *Scitamineæ*, as *Amomum* (his *Zingiber*), *Alpinia*, &c.; while *Canna* seems to have no Cotyledon, but only an Albumen. Can this be true? and if so, what is the value of such a distinction in a natural classification? The *Liliaceæ*, *Palmæ*, and now the *Orchideæ*, are acknowledged to be Acotyledonous, having only an Albumen; while the Grasses, so nearly allied to them, have one Cotyledon, for I presume their scale must be admitted as such. Gærtner's phrase of *Embryo monocotyledoneus* applied to these last-mentioned families may occasion a mistake, which would be avoided by the term *Embryo simplex*, or *indivisus*, expressing his idea of the simple figure appropriate to this part in such plants, but which does not prevent its upper extremity being strictly analogous to the *Plumula* of the *Dicotyledones*. It seems to me therefore that this learned writer is mistaken in saying the monocotyledonous plants never have any *Plumula*. They have not indeed that feather-like configuration in the ascending point of their Embryo which gave rise to the name, but the organ so called is, and must be, present. To dispute about the term is as little to the purpose as to contend that the *Orchideæ* have no *pollen*, because it is not of a powdery appearance.

From Mr. Lindsay's account of the germination of Ferns in our 2d Volume, this family must be deemed Monocotyledonous. Their germination seems at first analogous to that of Mosses, as given by Hedwig in his *Theoria*, but the numerous and branched Cotyledons of the latter overset all analogy, and indeed all classification of plants by the number of the parts in question. Nothing could be more unnatural than to separate

Mosses

Mosses for this reason from the other Cryptogamic vegetables, and therefore Jussieu can scarcely believe these parts to be Cotyledons; yet it is not possible to call them any thing else, and to suppose them a peculiar, and hitherto unheard-of, organ, would but increase the difficulty. Gærtner in the Introduction to his great work, *p.* 157, tells us he has seen many Cotyledons in several *Fuci* also, and that he suspects others of the more imperfect plants, hitherto referred to the *Monocotyledones,* may be similarly circumstanced. It seems that too much, by far, has been taken for granted in this department, though the parts under consideration form the great hinge upon which all natural systems turn. It is only by analogy that the great family, or natural order, of *Lichenes* has been judged Monocotyledonous, an analogy which the *Fuci,* if Gærtner be correct, render very doubtful. The germination of the *Fungi* is at least equally uncertain.

I mean not however by any means to invalidate the importance of the distinction between such plants as have two or more Cotyledons, and such as have only one or none, however inaccurate the terms commonly used to distinguish them may be. Much less am I inclined to throw any needless impediments in the way of those who labour at the arduous and important study of natural classification, or to detract from the well-earned fame of such men as Gærtner and Jussieu, on account of difficulties and imperfections unavoidable in so abstruse a study. No real friend to truth and knowledge ever foments invidious rivalships in philosophy. The field of science is now so vast, that its different cultivators find the advantage of dividing their tasks, and thus the students of physiology, of natural systems, and of artificial ones, may all powerfully assist each other. Truth is pursued by different paths, and nothing is more pleas-

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ing than to see the various observers of Nature in a Society like ours, mutually and harmoniously contributing, as we have all along done, to enrich the scientific hive. I would therefore conclude by recommending those who have leisure and opportunity for the purpose, to observe for themselves the germination of the principal families of plants, not only of such genera as are in dispute, but of all about which there can be any doubt, most of which will easily be indicated by a comparison of Gærtner's work with the remarks in the foregoing pages.

Norwich, Nov. 2, 1807.

 XVI. *Ob-*

XVI. *Observations on Nauclea Gambir, the Plant producing the Drug called Gutta Gambeer, with Characters of two other Species. By William Hunter, Esq. Secretary to the Asiatic Society. Communicated by the President.*

Read June 16, 1807.

It has been a question, among naturalists and writers on the materia medica, whether the little cakes or lozenges called *Gutta Gambeer* be prepared from the *Mimosa Catechu*, or the produce of a different plant*. This question, if not already determined, I am enabled to resolve by actual observation, having seen the substance made from a species of *Nauclea*, of which I beg leave to offer the following description.

1. Nauclea Gambir.

Funis uncatus. Daun Gatta Gambir. *Rumph. Amb. t.* 5. 63. *t.* 34. *f.* 2.

Climbing. Branches round. Leaves ovate, pointed, smooth. Stipules two, lateral, caducous. Peduncles axillary, solitary, simple, jointed.

Stem shrubby, twining to a great height, covered with a rough brown bark.

* Murray, Appar. Med. vol. ii. p. 549.

Branches

Nauclea Gambir.

Branches crowded, round, smooth; branchlets opposite, widely spreading.

Leaves opposite, petiolated, ovate, pointed, waving, widely spreading, smooth, below marked with transverse parallel veins.

Stipules at the bases of the branchlets and petioles, two, lateral, parabolical, sessile, widely-spreading, smooth, caducous.

Peduncles axillary, solitary, round, straight, horizontal, much shorter than the leaves; jointed near the apex and bracteated: after the flowers have fallen, the lower joint persistent, recurved, forming a hooked spine.

Bracteas four, ovate, acute, spreading, very small, caducous.

Flowers aggregate, globular; composed of very numerous florets, crowded on a globular, naked, very small receptacle.

Cal. Perianthium common, none.

Proper, one-leafed, oblong, incrusting the germen, persistent; mouth five-cleft, divisions lanceolate, erect.

Cor. as in the Genus.

Stam. Filaments five, very short. Anthers oblong.

Capsule stalked, oblong, incrusted and crowned with the calyx; tapering to a point below; two-celled, two-valved; the valves adhering at the apex, splitting at the sides.

Seeds very numerous, oblong, very small, compressed, furnished at both ends with a membranous pappus.

The flowers, when fully spread, I suppose last a very short time; for although I have frequently looked for them, I was never able to find them, whence I have been obliged to omit the description of the Pistil.

 From

From the leaves of this shrub is prepared the substance called *Gutta Gambeer*, in two ways. The first is by boiling the leaves*. This process was performed under my inspection, by a Chinese, at *Prince of Wales's Island*. Seven catties (or 9⅓ lbs.) of the leaves, plucked clean from the stalks, were boiled in a large pot for one hour and a half, adding more water as the first wasted, till towards the end of the process, when it was inspissated to the consistence of a very thin sirup. When taken off the fire, and allowed to cool, it became solid. It was then cut into little squares, which were dried in the sun, turning them frequently. After one month, I weighed them, and found ten ounces and two drachms, troy weight.

The *Gambeer*, prepared according to this process, is of a brown colour; but from some parts of the *Malay* coast, and of *Sumatra*, it is brought in little round cakes almost perfectly white. According to Dr. Campbell of *Bencoolen*, this is made by cutting small the leaves and young twigs, and infusing them in water for some hours, when a fæcula is deposited, which is inspissated by the heat of the sun, and moulded into round cakes.

The *Gambeer*, when first tasted, impresses on the palate a strong sensation of bitter and astringency. But it afterwards leaves a sweetish taste, which remains a long time. From these sensible qualities, it might reasonably be expected to prove useful in medicine. And accordingly, we are told that it has been found beneficial in angina and aphthæ, as well as in diarrhœa and dysentery. The drug was infused in water, to which it gave the colour of the infusion of bohea tea†. By

* See Marsden's Sumatra, p. 243,—where he quotes, for a particular account of the manufacture, the second volume of the Transactions of the Batavian Society.

† Murray l. c. Seba. item. Buisson apud Degner. de Dysent. p. 297.

the

the Malays it is mixed with lime, and applied externally to cuts, burns, boils, &c.

But the most frequent use of it is to chew, along with the leaves of Betel, in the same manner as the *Kut* (or Catechu) in other parts of India.

For this purpose the finest and whitest kind is selected. The red, being strong tasted and rank, is exported to *China* and *Batavia*, where it is used for the purposes of tanning and dyeing. For the first of these uses we might suppose, from its sensible qualities, that it is well calculated; and some rough experiments which I have made on it with animal gluten, compared with those of Dr. ROXBURGH on *Kut*, evince it to be richer in *Tannin* than that substance.

The chief places of manufacture are *Malacca*, *Siak* and *Rhio*; and the process of boiling is most generally practised; insomuch that the generality of manufacturers there are ignorant of there being any other. The colour and other qualities, they allege, depend on the vessel and the skill or attention of the operator. Thus an old manufacturer, with Chinese iron pots, will produce a whitish drug; whereas with a Malay iron pot its colour will be browner. The first cuttings also yield a whiter drug than the subsequent ones.

For the cultivation of this plant a rich red soil is preferred. It gives the most luxuriant crop when the rains are frequent, but does not thrive in grounds that are apt to be flooded. On this account the side of a hill is esteemed better than any other situation.

The plants are propagated from seed. In three months after sowing, they appear above the ground; after this they grow fast, and may be moved to the field when nine inches high. They are there planted at the distance of eight or nine feet, so that

one

one *orlong* (of eighty yards square) contains about seven hundred plants. At the end of one year from the time when they are planted in the field, a small crop of the leaves is obtained. A larger is got in eighteen months; and the third at the end of two years, when the bushes have attained their full growth. They continue in their prime, and admit of being cut twice a year, during a period of twenty or thirty years, provided care be taken to keep the ground clean and the roots free from weeds. Their tops must be cut so as to prevent them from growing to a greater height than five or six feet.

From good ground and a garden well kept, ten peculs (of 133$\frac{1}{3}$ lbs. each) of dry Gambeer are usually obtained on every orlong twice a year, or twenty peculs per annum. As it is cut every six months, and should then be boiled off, the leaves ought to be of the same age; but, from a want of means, it often happens that the year is nearly expired before the cutting is done, which should have been made at the end of six months. In this case the young leaves yield a whiter drug than the old. As to the quantity afforded by each, in proportion to the weight of leaves, I have received contradictory information, so that I conclude little attention has been paid to this circumstance.

The price of the drug, at Prince of Wales's Island, varies from four to eight Spanish dollars per pecul. The finest and whitest kind is that formed into little round cakes or lozenges. It is sold by tale, at three dollars and a half for the *Laxa* (or 10,000), and one *Laxa* weighs about 40 catties. This gives 8$\frac{3}{4}$ dollars for a *Pecul.*

The price of Sago at Prince of Wales's Island is generally about three dollars per pecul. Hence the manufacturer is often tempted to adulterate his Gambeer with this article, which mixes intimately, but may be detected by solution in water.

The

The figure Tab. XXII. is copied from a drawing transmitted by Dr. BERRY at *Madras*, to Dr. ROXBURGH. It exhibits the parts of the flower, which I was unable to find; and also another circumstance, which never fell under my observation, that is flower-bearing peduncles and recurved spines from the axillæ of the same pair of leaves. These spines are no doubt the peduncles of a former year.

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2. NAUCLEA ACIDA.

Climbing. Branches four-cornered, smooth. Leaves ovate, pointed, smooth. Stipules four, pointed. Peduncles axillary, solitary, simple, jointed, bracteated, recurved after flowering, persistent.

The leaves have an acid taste.

Found at *Soongey Clooan.*

3. NAUCLEA SCLEROPHYLLA.

Climbing. Branches four-cornered, pubescent. Leaves elliptic, short-pointed, rigid, rough below. Stipules two, lateral, lunate, two-lobed. Peduncles axillary, solitary, simple, jointed, bracteated, recurved after flowering, persistent.

Stem shrubby, climbing.

Branches opposite, brachiate, four-cornered, four-furrowed, pubescent, spreading.

Leaves large, opposite, decussated, elliptical, short-pointed, waving, rigid; above smooth; below pubescent, nerved, reticulated.

Petioles short, cylindrical, pubescent, spreading.

Stipules

Stipules two, lateral, lunate, two-lobed, horizontal.

Peduncles axillary, solitary, compressed, spreading, a little recurved, pubescent, twice the length of the petioles, near the apex jointed and bracteated: after the seeds have fallen, more recurved, and shar, like thorns.

Bracteas six, lanceolate, verticelled, at the joint of the peduncle.

Calyx common none; proper perianth continued above the germ, funnel-form, pubescent without; five-cleft, with segments lanceolate, erect.

Cor. funnel-shaped; tube twice as long as the calyx, dilated above, villous without; segments of the limb ovate, obtuse.

Stam. Filaments very small, in the throat of the tube. Anthers lunulate, bifid at the base, incumbent.

Pist. Germen ovate, easily split into two when the calyx is removed. Stigma ovate.

Found on the top of the hill at the same place.

XVII. *Obser-*

XVII. *Observations respecting several British Species of Hieracium.* *By James Edward Smith, M.D. F.R.S. P.L.S.*

Read January 19, *and February* 2, 1808.

If it be incumbent on the more experienced cultivators of Natural History to correct the errors of their predecessors or contemporaries, when they can do it with certainty; it is more especially the duty of every man to correct his own, whenever they become manifest to him, either by his own deliberate subsequent inquiries, or the remarks of other persons. Nor is he exempted from this duty, unless such remarks originate in sinister motives, and are in themselves manifestly false or totally contemptible.

Several species of *Hieracium* generally presumed to be natives of Britain are involved in great doubt, and there are others concerning which the best English botanists are not sufficiently informed to give them as yet a place in their Floras. Of the former I shall now principally speak, taking them in their proper order.

The two first which present themselves in this light are

Hieracium dubium and Auricula.

Both these are allowed a place in the *Flora Britannica* on the authority of Hudson alone, for I never heard of any other person who had gathered them in Britain, nor of any who had even seen a native specimen of either. I have examined the neighbourhood

bourhood of the places mentioned in the *Flora Anglica,* and so I believe have many other botanists, without finding any thing which could be referred to these species. I was therefore obliged to content myself with avowedly copying Hudson, subjoining whatever I could ascertain as illustrative of these species; and in doing this I have been thought by a learned friend to have taken the one for the other. From this supposed error I now wish to exculpate myself;—at the same time the following observations may clear up the history of these plants, hitherto almost equally obscure to the botanists of every country in Europe.

It is necessary to premise that these two species are as distinct as possible from each other. What I understand as *H. dubium* is strikingly related to *Pilosella,* from which it differs chiefly in having more than one flower, generally 3 or 4, on a stalk, and hence probably obtained the name of *dubium.* Its leaves are short, obovate, blunt, much fringed at the base; its flowers lemon-coloured both above and below; its calyx woolly, sprinkled with scattered, very short, black hairs. This is *H. Auricula* of *Fl. Dan. t.* 1111.

My *H. Auricula,* the *dubium* of *Fl. Dan. t.* 1044, is generally a taller and larger plant, with fewer and smaller scyons from the root, longer and perfectly acute leaves, which are less copiously and regularly fringed; its flowers smaller, more numerous, of the full yellow or orange-colour usual in the genus; the calyx clothed with very black long dense hairs.

I now proceed to a chronological history of each.

Hieracium dubium is first mentioned by Linnæus in the first edition of his *Flora Suecica, No.* 634, under the specific character of "*foliis integris ovato-oblongis, stolone repente, scapo nudo multifloro.*" In the first edition of *Species Plantarum* it occurs under the same definition, except the advantageous alteration of

of *stolonibus* for *stolone*, and the addition of its trivial name *dubium*, such names having been first used by Linnæus in the last-mentioned work. Now this definition accords well with *H. dubium* of *Fl. Brit.*, (the *H. Auricula* of *Fl. Dan.*) whose leaves are obovate as in *H. Pilosella*, and almost, if not perfectly, entire, that is, free from teeth or serratures. At this time Linnæus had not contrived the term obovate, neither had he confined the words *folia integra* to undivided leaves, without respect to their margin. Four synonyms are subjoined in the *Flora Suecica*, which I shall now examine.

1. *Hieracium foliis virentibus pilosis ovato-lanceolatis, scapo simplici multifloro. Haller Helv.* (1st edition), 743. This author mentions the leaves being "ciliated, as it were, at their footstalk (or base), and that the flowers are sulphur-coloured." He quotes Tabernæmontanus's *Pilosella major prima, Ic.* 196, and the synonym of Vaillant hereafter mentioned, besides others, all which circumstances leave no doubt of his plant being my *dubium*. This plant of Haller is the No. 53 of his 2d edition and of his *Nomenclator*, and what I have as such from Reynier and Davall is my *dubium;* but I must not conceal that Linnæus has written "*Pilosella Auricula*" in the margin of his copy of Haller's 1st edition.

2. *Hieracium piloselloides vulgare. Vaillant Mem. de l'Acad. des Sciences, for* 1721, *species* 1. This is said in his *Botanicon Parisiense*, 101, to have its flowers lemon-coloured on both sides, and sometimes 4 or 5 on a stalk. No other decisive information is to be obtained from this author. In the German edition of his *Memoire*, which is the only one now within my reach, Linnæus has written "*Hieracium dubium*" in the margin, so that his opinion here exactly neutralizes the note in his Haller, and

 we

we can only by other authorities judge between the two, and these accord with his note in Vaillant.

3. *Dens leonis, qui Pilosella folio minùs villoso. Tourn. Inst.* 469. Against this Linnæus has written, in his own copy, *H. dubium*, and the hand-writing, as well as the colour of the ink, agrees with names written in his herbarium when the *Species Plantarum* was first published. From Tournefort's work nothing is even to be guessed but by means of his synonyms. He quotes Bauhin's *Pinax*, hereafter mentioned, also *Pilosella major* of Camerarius's *Epitome*, 709, drawn with one large flower on each stalk; and *Pilosella minor, folio angustiore, minùs piloso, repens, J. Bauh. Hist. v.* 2. 1040, which has long lanceolate sharp leaves, many small flowers on a stalk, and appears to be either my *H. Auricula*, or *H. cymosum;* but the description throws no light upon the subject, and perhaps does not belong to the figure.

4. *Pilosella major repens minùs hirsuta. Bauh. Pin.* 262. Linnæus has likewise written *H. dubium* here in his copy of the *Pinax*. Bauhin quotes the *Pilosella major* of *Camer. Epit.* and also *Lactucella sylvestris repens* of the same author, in his *Hortus*, 82, where is to be found a description agreeing with my *H. dubium* much better than with *Auricula*.

In the first edition of *Sp. Pl.* Linnæus quotes no synonyms but this of Bauhin, and his own *Fl. Suec.* just mentioned; except Dalibard, from whom nothing is here to be learned, and Sauvages, who merely mentions that the leaves of his plant are *lanceolato-ovalia;* but this accords with my *H. dubium* and not with *Auricula:* it therefore establishes the propriety of his synonym.

In the second edition of *Fl. Suecica*, which comes next in chronological order, *H. dubium* appears with its specific name,

but

but its original character is unchanged, nor is there any alteration in the synonyms, except that Tournefort's is omitted, and a reference to the *Sp. Plant.* introduced. There is however the following observation.

"*Rarissimè et passim occurrit, sequenti major, fortè hybrida vel alia qualiscunque varietas, omnibus partibus major, nec repens.*"

This note is very puzzling, as contradicting the specific character, and I conceive it alludes not to the plant in its usual state, but to a supposed variety, being to be understood as follows.

"It very rarely here and there occurs of a larger size than the following" (which is what I take for *Auricula*) "and is perhaps a mule or some other kind of variety, larger in all its parts, and not creeping."

Now this agrees with *H. ambiguum* of *Ehrhart's Herb.* 108, gathered by him at Upsal, and which is really the *cymosum* of Linnæus, though not mentioned as such in the *Fl. Suec.* This species is indeed larger than my *Auricula*, though otherwise resembling it, and rarely throws out any creeping scyons.

I shall conclude my evidences of *H. dubium*, where in most cases I should have begun, with a reference to the Linnæan herbarium. There we find one specimen only of the plant which I take for such, marked in ink "*No.* 6. *dubium?*" (with a sign of doubt) without any place of growth, or any pencil mark; which last is found on most of the authentic specimens that Linnæus had before him when he wrote the 1st edition of *Sp. Plant.* being preparatory to his final distribution of them. The No. 6 refers to that work, but his own copy of it is not marked with a reference to his herbarium, as if he had had an authentic specimen there.

There is no alteration nor addition respecting this species in the

the 2d edition of *Sp. Plant.* except a reference to Gouan, whose plant is that of Sauvages. In the interleaved copy of this 2d edition I find the following note. "*Caulis hirtus. Folia hirta, præsertim subtùs.*" This is printed in the *Syst. Veg.* but throws no light upon the subject in dispute. With it is a mutilated extract, written with a trembling hand when Linnæus was very infirm, from Scholler's *Flora Barbiensis*, which shows how anxious he was to the last for any new light respecting this doubtful plant. The original passage in Scholler is much to our purpose, and runs thus.

"*Folia obtusa, pilis rarioribus adspersa. Caulis parùm hirsutus, uno alterove foliolo donatus; flores 2 aut 3 in cacumine ferens.*" This suits what I understand to be *H. dubium*, but does not accord with *H. Auricula.* The latter is as characteristically described by Scholler thus. "*Folia acuta. Caulis et calyces nigris setis adspersi. Folia pilis longis hispida.*" So that this author understood the two species as I do, and Linnæus by copying him as above, surely sanctions his opinion. For this reason alone I cite him, for I could produce abundance of secondary authorities on my side, but my object is to ascertain the opinion of Linnæus.

HIERACIUM AURICULA of Linnæus is first mentioned by him in his *Fl. Lapponica, n.* 282, and afterwards in the 1st edition of *Fl. Suec. n.* 635, but of course, without the trivial name, which first appears in *Sp. Pl. ed.* 1. He speaks of it as common in the grassy wilds of Lapland, and quotes Linders and Frankenius, two Swedish writers, who only serve to prove the plant he meant a well-known native of Sweden. The former terms it *Auricula muris angustifolia minor.* These authors are however not quoted in the *Fl. Suec.* I proceed to examine the synonyms and remarks

marks in the latter work, according to the plan I have followed respecting the former species.

The specific character runs thus. "*Foliis integerrimis lanceolatis, scapo nudo multifloro.*" This is continued in the 2d edition of *Fl. Suec.* and the first of *Sp. Pl.*, the words "*stolonibus reptantibus*" being added in the 2d edition of the latter. This character accords with my *H. Auricula*, the word *lanceolatis* being precisely applicable to that and not to my *dubium.*

1. *Hieracium foliis integerrimis, caule repente, scapo nudo multifloro. Hort. Cliff.* 388. *n.* 8. Here we find a description in which the leaves are said to be "lanceolate, erect, green, scarcely so long as the finger—flowers several—calyx encompassed with black hairs—radical scyons slender, furnished with very small leaves." These characters precisely indicate my *Auricula*, and not the *dubium.*

2. *H. piloselloides florentinum vulgari simile. Vaillant Mem. de l'Acad. des Sciences for* 1721, species 2. This is an erroneous quotation, belonging to the *H. florentinum* of Allioni, *Fl. Ped. v.* 1. 213, Haller's *No.* 54, a plant unknown to Linnæus, on which I need not at present dwell, as it is much more remote from my *dubium* than from the species at present under consideration.

3. *H. pilosellæ folio erectum minus. Tourn. Inst.* 471. Besides Bauhin's *Pinax*, hereafter mentioned, Tournefort quotes only the *Pilosella major prima* of Tabernæmontanus, which I have already mentioned as quoted by Haller for *H. dubium*, in my opinion justly. The only way therefore of judging concerning this synonym of Tournefort is by the species along with which he has arranged it, and these are *H. præmorsum*, *cymosum*, *aurantiacum*, &c., all closely allied to my *Auricula*, and not to *dubium*, which latter

latter Tournefort places next to *Pilosella*, in his genus *Dens Leonis*, as above mentioned.

4. *Pilosella major erecta altera. Bauh. Pin.* 262. This author quotes the synonym of Tabernæmontanus, *P. major prima*, and *P. major latifolia* of Gerarde. Now the figure of the latter is the very same wooden cut as the *P. major altera* of Tabernæmontanus, *Ic.* 197, which latter I therefore presume Bauhin meant to quote, instead of the *prima*, and that this error of his misled Tournefort, as noticed above. This *P. major altera* may be *Hieracium Auricula*, or *florentinum*, or *cymosum*, but most assuredly not my *dubium*.

5. *Pilosella repens minor, caule* (*erecto*) *pedali, polyanthes, foliis angustis oblongis. Raii. App.* (*Hist. Pl. v.* 3), 147. The description of this author is not very precise as to our purpose, and perhaps agrees rather better with *H. dubium* than with *Auricula*, but nothing conclusive can be gathered from it.

6. *Pilosella. Till. Ic.* 14. On this figure a learned botanist of my acquaintance has chiefly rested his opinion of the plant now under consideration being *H. dubium*, which the said figure is thought most to resemble. I was staggered by this, as the work of Tillands might be supposed good authority for a Swedish plant, and to represent the most common species there of the two, not so rare an one as my *dubium* is said to be. But I perceive with no less surprise than satisfaction that this very figure is a servile copy of the *Pilosella major prima* of Tabernæmontanus, and therefore in itself of no authority at all. Indeed Linnæus has omitted to refer to it in the subsequent edition of his *Flora*.

To these synonyms a remark is subjoined in both editions of the *Fl. Suec.* as follows.

" *Folia*

"*Folia lanceolata, acuta. Caules et calyces nigris setis adspersi; folia hispida minimis pilis. In hortum academicum translata* 1742, *caulem bipedalem* 1743, *et flores quasi in umbellam, longis pedunculis innixos, producebat.*" All this suits my *Auricula.*

I now proceed to the evidence of the Linnæan herbarium, which is much more conclusive here than in the former instance.

In that collection is a specimen of what I understand as *H. Auricula*, marked as such by Linnæus himself, and agreeing with all that he says about it. This is pinned to another, numbered 7, and both together were unquestionably considered by Linnæus, when he wrote his first edition of *Sp. Pl.*, as *H. Auricula*, to which the number refers in that work, and his copy of the book is marked, indicating that he had the plant. But when he wrote his 2d edition of *Sp. Pl.*, he distinguished between these two specimens, elaborately describing the latter by the name of *cymosum*, and leaving the other with its original denomination of *Auricula*. I conceive this decides the question between *H. dubium* and *Auricula*, and that the 2 species are mistaken for each other in the *Fl. Danica*. How far the *cymosum*, Ehrhart's *ambiguum*, may be really distinct from the *Auricula* is another question. It appears to me only a larger plant. The *cymosum* of most authors appears to be the *florentinum* of Allioni. It may perhaps be not uninteresting to give here the opinion of my late friend Mr. Davall, whose accuracy and penetration I have daily opportunities of proving, concerning these and the neighbouring species in Haller's *Historia* and *Nomenclator.*

His No. 50 is, of course, *H. aurantiacum.*
51 *præmorsum.*
51* *cymosum.*
52 *Auricula.*
53 *dubium.*

 His

His No. 54 *florentinum, Allioni.*
55 *Pilosella.*

I find the late Mr. Dick sent No. 52 to Jacquin, as *H. dubium*, and hence misled the latter to consider 53 as *Auricula*, which appears by specimens from his herbarium, given me by Sir Joseph Banks. But indeed Jacquin seems to have confounded the two. The eminent German botanists Roth, Host, and Willdenow appear to have understood these plants as I do. I trust there cannot in future be any confusion between them, and my anxiety to prevent this must excuse my prolixity on so dry a subject.

Hieracium murorum.

It has been suggested by Mr. Edward Forster, F.L.S., that the real *H. murorum* of Linnæus is the β of *Fl. Brit.* The following particulars will confirm this suggestion, and at the same time account for, if not excuse, my mistake respecting this point.

Hieracium No. 637, *Fl. Suec. ed.* 1, *caule ramoso, foliis radicalibus ovatis dentatis, caulino minore*, the first authority for this Linnæan species, is certainly my variety β, the *H. macrocaulon hirsutum, folio rotundiore*, of Ray, and the Round Hawklung of Petiver, *t.* 13. *f.* 2.—*Pulmonaria gallica sive aurea, Tabernæmont. Ic.* 194, is a most excellent representation of it. *Pilosella major quibusdam, aliis Pulmonaria flore luteo*, of J. Bauhin's *Historia*, *v.* 2. 1033, must be the same, his figure being a copy of that of Tabernæmontanus. He gives as its synonym his brother's *Hieracium murorum, folio pilosissimo, Pin.* 129.

This Swedish plant is preserved in the Linnæan herbarium, marked *murorum*, and numbered 15 in reference to *Sp. Pl. ed.* 1. I have received it from Mr. E. Forster, who observes that it is known by having only one, rather small, cauline leaf, either in a wild

a wild or cultivated state. That it is rather a rare English plant, he being not sure of having gathered it wild except "on Chedder cliffs, Somersetshire; on Pennard castle, Glamorganshire; and on rocks at Downton near Ludlow. It grows on an old wall near Enfield palace, but may have been naturalized there, as that was the site of Uvedale's garden." Besides the solitary cauline leaf, this plant is remarkable for its numerous, broad, rounded or heart-shaped radical leaves, which are always more or less wavy in the margin, especially towards their base, where they are often deeply toothed, and their teeth are singularly radiated or divaricated, the first pair mostly pointing towards the root. The Linnæan specimen shows this strongly; Mr. E. Forster's less remarkably. This accounts for Linnæus's having quoted the *Pulmonaria gallica fœmina* of Tabernæmontanus, *Ic.* 195, (instead of the figure above mentioned,) as it expresses this character very strikingly, as does J. Bauhin's *Pilosellæ majoris, sive Pulmonariæ luteæ species magis laciniata, Hist. v.* 2. 1034. I have indeed no doubt that these two figures of Tabernæmontanus, and consequently those in J. Bauhin, represent mere varieties of one species.

But my *murorum* α is also preserved in the Linnæan herbarium, pinned to the former, with a corresponding number. Linnæus has written on its back that "Gmelin affirms this to be the *H. murorum folio pilosissimo* of C. Bauhin," and it is evidently that "very hairy variety" which Linnæus mentions, how correctly I know not, as never found in Sweden. This specimen of Gmelin probably led him, in the 2d edition of *Sp. Pl.*, to quote *H. macrocaulon hirsutum folio rotundiore, Raii Syn.* 169, as a third variety of his *murorum;* but in copying Ray he has written *longiore* for *rotundiore,* the former word agreeing with his specimen best. His own copy of the *Synopsis* shows he meant No. 8 of that work, not No. 9, and I believe he is correct as to this

 No. 8,

No. 8, except that it is his identical *murorum*, and not a variety. Ray, like Gmelin, has misapplied the above synonym of Bauhin to my *murorum α*, his No. 6, a common plant, especially on walls, having lanceolate rather than ovate leaves, several of them growing on the stem, their teeth all pointing forward, and not divaricated. Ray further errs in his quotations of J. Bauhin and Gerarde for the same plant, which is well figured by Petiver, *t.* 13, *f.* 4, and given by Ehrhart in his *Herbæ Exsiccatæ*, *No.* 147, from Hanover, as the real *H. murorum* of Linnæus. I shall speak of it presently as a distinct species, by the name of *sylvaticum*. Linnæus misled me to quote the *Corchorus* of Dalechamp, which is the true *murorum*, for this species, or supposed variety. It will readily appear how far he combined with Ray and Gmelin to induce me to consider my *murorum α* as the *H. murorum folio pilosissimo* of Bauhin, and therefore as his own primary *murorum*. My attention having been recalled to the subject by Mr. E. Forster has not only convinced me of this error, but also enabled me now first to comprehend the two varieties of the real Linnæan *murorum*, whose synonyms I venture to arrange as follows, under the annexed specific character.

H. *murorum*, caule ramoso, foliis cordato-ovatis repandis basi præcipuè radiato-dentatis: caulino solitario.

α. H. murorum *α*. *Sp. Pl. ed.* 1. 802. *ed.* 2. 1128. *Fl. Suec. ed.* 1. *n.* 637; *ed.* 2. *n.* 701. *Fl. Lapp. n.* 284. *Gmel. Sib. v.* 2. 25. *n.* 22.

H. murorum *β*. *Fl. Brit.* 830.

H. murorum folio pilosissimo. *Bauh. Pin.* 129, decided by his synonyms.

H. macrocaulon hirsutum, folio rotundiore. *Raii Syn. ed.* 2. 74. *ed.* 3. 169.

Alsine, seu Auricula muris major. *Trag. Hist.* 276.

Pulmonaria

Pulmonaria gallorum, sive Auricula muris major Tragi. *Dalech. Hist.* 1328. also Corchorus. *Ibid.* 565; with the very same wooden cut, which is copied from that of Tragus.

P. gallica sive aurea. *Tabernæmont. Ic.* 194, *opt.*

P. gallica mas. *Tabernæmont. Kreuterb.* 504, *opt.*

P. gallica sive aurea latifolia. *Ger. em.* 304.

Pilosella major quibusdam, aliis Pulmonaria flore luteo. *Bauh. Hist. v.* 2. 1033; copied from the last.

Round Hawklung. *Petiv. H. Brit. t.* 13. *f.* 2.

Pulmonaria gallorum rotundifolia lævior. *Barrel. Ic. t.* 342; seems merely a smoother state of this variety.

β. H. murorum *β. Sp. Pl. ed.* 1. 803. *ed.* 2. 1128. *Fl. Succ. ed.* 2. *No.* 701, *β. Herb. Linn.*

H. murorum laciniatum minùs pilosum. *Bauh. Pin.* 129.

Pulmonaria gallica fœmina. *Tabernæmont. Ic.* 195. *Kreuterb.* 504.

Pilosellæ majoris, sive Pulmonariæ luteæ species magis laciniata. *Bauh. Hist. v.* 2. 1034; copied from the last.

I am much inclined to consider Ray's *Hieracium leptocaulon hirsutum folio longiore* as belonging to this variety; but on that subject more will be said under *H. sylvaticum β.*

HIERACIUM SYLVATICUM.

Before I proceed to define what must in future pass under this name, I cannot but give the truly curious history of the *Hieracium Pulmonaria dictum angustifolium* of Ray, on which this species originally depended for a place among British plants.

Johnson in *Ger. em.* 304 describes and figures a *Pulmonaria gallica seu aurea angustifolia,* found "on a hill at Sidmonton not far from Newbery, in an old Roman camp, close by the decuman port," which he tells us Lobel and C. Bauhin confound with the *H. murorum folio pilosissimo* of the latter. This is clearly true

with

with respect to Bauhin; and Lobel's account, such as it is, of this plant, in his *Adversaria* 253, should seem to belong to what Bauhin intended, the *H. murorum* of Linnæus; while the figure in Lobel's *Observationes* 317, and *Icones* 587, is a very different thing, being the very same cut as Johnson uses in *Ger. em.* 304. How Lobel came by this cut I know not, but it unquestionably belongs to Johnson's description. Ray adopts this plant entirely on Johnson's authority, *Syn. ed.* 2. 74; and Dillenius does the same, *ed.* 3. 168, only adding a Welch station for it, on the authority of Dr. Richardson. What the plant of Richardson may be, matters little. My friend Dr. Lamb, F.L.S., has helped me to decide upon the plant of Johnson, by means of a specimen gathered about 10 yards to the south of the abovesaid decuman port, and I have perceived with unfeigned surprise, that it is no other than a variety of *Cineraria integrifolia!* The specimen is more dilated and less woolly than usual, and so precisely accords with the figure and description in *Ger. em.* that the only wonder is how any person could take the original plant for a *Hieracium.* Peace be to the *manes* of Johnson, Lobel, and Ray, while they settle among themselves their appropriate shares of the error!—I believe no other British genus can afford an example of two such mistakes in Ray as this and what I have noticed concerning *H. murorum.* The synonyms of Ray and *Ger. em.* as well as Petiver's *t.* 13. *f.* 5, a copy of the latter, are therefore to be removed from *H. sylvaticum* in the *Fl. Brit.* to designate a variety of *Cineraria integrifolia.*

Now whether Dr. Withering found this *Cineraria* on Dudley castle hill, or whether the plant of Richardson and Dillenius be the same or not, I have no means of determining. By Withering's reference to Allioni's *tab.* 28. *f.* 1, which that author confounds under *Hieracium murorum*, and to the *H. sylvaticum* of Gouan, (whose description well agrees with *H. murorum α Fl. Brit.*,

Brit., though his synonyms are extremely confused,) I am led to consider Withering's plant as Ray's, not Bauhin's, *H. murorum folio pilosissimo*, and to retain for it the name of *sylvaticum;* only remarking that it is not the Linnæan variety of the true *murorum* marked *sylvaticum* in the margin of *Sp. Pl.* I decline choosing a new name for it, because this has been adopted amongst us, and because it is difficult to find a more expressive one, not pre-occupied in some one or other of the authors who have lent their hands to elucidate or to embroil the species of *Hieracium*. But while I consider this as the *sylvaticum* of Withering, I must remark that it is also confounded in the otherwise excellent description of *H. murorum* given in his work from Mr. Woodward, though it seems Dr. Withering himself had correct ideas of the *murorum*.

My own account of *H. sylvaticum Fl. Brit.* being professedly taken from this writer, for I never till now could ascertain any thing certain about it, I subjoin the following more correct character and synonyms of what is now to go by this name, and which is a very frequent species in England.

H. *sylvaticum*, caule ramoso, foliis ovato-lanceolatis basi præcipuè antrorsùm dentatis: caulinis pluribus.

α. H. sylvaticum. *Gouan. Obs.* 56, *ex descr. With.* 687. *Galpine* 67.

H. murorum. *Ehrh. Herb.* 147. *Allion. Ped. t.* 23. *f.* 1. *Fl. Brit.* α. 830.

H. murorum folio pilosissimo. *Raii Syn. ed.* 2. 74. *ed.* 3. 168.

Pulmonaria gallica tenuifolia. *Tabern. Ic.* 195. *Kreuterb.* 505.

Pilosellæ majoris, sive Pulmonariæ luteæ species angustifolia. *Bauh. Hist. v.* 2. 1034.

French Hawklung. *Petiv. H. Brit. t.* 13. *f.* 4.

β. Hieracium

β. Hieracium leptocaulon hirsutum, folio longiore. *Raii Syn. ed.* 2. 74. *ed.* 3. 169?

H. sylvaticum. *Fl. Dan. t.* 1113.

H. murorum γ. *Fl. Brit.* 830.

H. pulmonarioides. *Villars Dauph. v.* 3. 133. *t.* 34?

H. glaucum pilosum, foliis parùm dentatis. *Dill. Elth.* 180. *t.* 149?

Some uncertainty arises with respect to the synonym of Ray for this variety, from his saying that "*as far as he remembers*, there were no leaves on the stem of his plant, but all grew from the root." This, if true, agrees with the genuine *H. murorum*, and makes me more than half inclined to remove the said synonym to the cut-leaved variety (β) of *H. murorum;* yet the words *folio longiore* certainly agree best with the species before us, and such is Mr. E. Forster's opinion. We must look to some Westmoreland botanist to decide this question. Petiver's authority may not be thought of much weight, but he gives as a representation of this plant of Ray a copy of the *Pulmonaria gallica fœmina* of Tabernæmontanus, which I have already cited under *H. murorum* β. The description of Ray accords perfectly with this, except that he has not noticed the remarkable incisions in the leaves; and on the other hand the slenderness of the stem does not agree with the plant now under consideration, whose stem is stout and leafy.

This variety of *H. sylvaticum* was brought from Westmoreland to Norwich in the year 1781, by the late Mr. Crowe, and having been planted in his garden, has since naturalized itself in the neighbourhood, in my own garden among others. Its leaves are elegantly speckled with black, and of a darker green than the common kind. The whole plant is also larger and stronger, with very numerous flowers, but I can find no specific mark of distinction,

stinction, though it is a permanent variety, unaltered when propagated by seed.

A specimen from Villars himself of his *H. pulmonarioides* accords in every particular with this variety, except that it is not above half so tall, and its calyx and flower-stalks are rather more abundant in black prominent glandular hairs, both circumstances to be attributed probably to its being a wild specimen. I have thought it safest however to quote this excellent author with a mark of doubt. My plant has no affinity to *H. amplexicaule*, with which he compares his.

To this writer I am obliged for occasioning me to stumble upon the plant of Dillenius, *t.* 149, which Villars cites under *cerinthoides*, certainly without any propriety, but which I confess myself, like my predecessors, to have hitherto overlooked or left undecided in despair. Dillenius refers it, with doubt, to Ray's *H. macrocaulon hirsutum folio rotundiore*, which is certainly *H. murorum* of Linnæus as above mentioned. This plant of Dillenius, found by Richardson, cannot be referred to that species, on account of the lanceolate and decurrent form of its radical leaves, and especially the manner in which they are toothed; not to mention its more leafy stem; in all which points it agrees with *sylvaticum*. Yet its "glaucous leaves and pale yellow flowers" do not suit either variety of the *sylvaticum*. This plate of the *Hortus Elthamensis* is one of the very few left unmarked by Linnæus in his own copy of that work. It is surely the *H. Lawsoni* of Villars, of which I have a Pyrenean specimen, gathered by Mons. de St. Amans, and given me by the Rev. Mr. Kirby, seemingly authentic. Villars considers this as *H. leptocaulon hirsutum folio longiore* of Lawson and Ray, which we have just found so much difficulty in determining, and, if right, he has cleared up a very difficult question for us British

 botanists,

botanists, which Dillenius and Petiver have helped to obscure. I must leave the matter still in doubt till we recover the plants of Lawson and Richardson, from their native places of growth in Westmoreland, an object well worthy the attention of some accurate travelling botanist, who may perhaps be rewarded by finding *H. dubium* and *Auricula* in the same tour.

HIERACIUM CERINTHOIDES.

I am enabled to add this species to the list of British Hawkweeds, on the authority of a specimen sent in 1803 by Mr. George Don, who informs me it is by no means a scarce plant in the highlands of Scotland, growing upon rocks. Its character and synonyms are as follows :

H. *cerinthoides*, caule corymboso, foliis pilosis subdenticulatis: caulinis oblongis semiamplexicaulibus; radicalibus obovatis, petiolis barbatis.

H. cerinthoides. *Sp. Pl. ed.* 1. 803. *ed.* 2. 1129. *Willd. Sp. Pl. v.* 3. 1580. *Gouan. Illustr.* 58. *t.* 22. *f.* 4. *Villars Dauph. v.* 3. 110. *t.* 32.

H. pyrenaicum folio cerinthes, latifolium et angustifolium. *Schola Botanica*, 189. *Tourn. Inst.* 472.

In the 2d edition of *Sp. Pl.* Linnæus cites for comparison with this a plant of Haller, which is no other than *H. villosum. H. cerinthoides* is not known to be a Swiss plant, at least it is not among those of Haller, his *No.* 36, which has been taken for it, proving upon comparison to be the *amplexicaule* of Linnæus. I have two specimens of the *cerinthoides* in Mr. Davall's herbarium, but no indication of their being gathered in Switzerland. Few authors seem to have known this species, for Tournefort merely copied the two barren definitions, under which it stands in the

Schola Botanica, supposed to have been published by the celebrated William Sherard. It may therefore be esteemed a curious addition to our *Flora*. We are also indebted to Mr. G. Don, for *H. aurantiacum*, as mentioned in *Eng. Bot. t.* 1469; and I have imperfect information, or insufficient specimens, of several more Scottish species of this difficult genus, which I hope future observations may elucidate.

 XVIII. *Spe-*

XVIII. *Specific Characters of the Decandrous Papilionaceous Plants of New Holland. By James Edward Smith, M.D. F.R.S. P.L.S.*

Read February 16, 1808.

In the first volume of Dr. Sims and Mr. Konig's *Annals of Botany*, *p.* 501, I attempted a discrimination of the genera of this intricate tribe, merely enumerating the species of each genus that were already described by authors, and giving specific characters of new ones only. It has been suggested that the uniformity of my plan required characters of all the species, those already extant being mostly useless, in consequence of the previously unfixed state of the genera; for Linnæus well observes that a specific name or character without an established generic one, is "like a clapper without a bell." I the more readily undertake to supply the above-mentioned deficiency, because the liberality of my much-valued friend Mr. Menzies has enabled me to enrich my catalogue of species with several new ones. I regret that from the discontinuance of the very useful work in which my first essay on this subject appeared, the sequel must be destined to a different publication; still this can be but of small moment to those few botanists who may be expected to look deeply into the matter, and who, most assuredly, will be furnished with both. I think it best here to repeat the essential characters of each genus, more especially as some of them may receive improvement or correction in consequence of subsequent observa-

observations. Under the definition of each species I confine myself to a citation of figures, omitting other synonyms already given, either in that part of the *Annals* above quoted, or by Mr. Dryander in the second volume of the same publication, *p.* 518—520. A great portion of these plants indeed require to be illustrated by plates, particularly the many new species which I am here, for the first time, about to describe. But as they probably have fallen in the way of Mr. Brown and Mr. Bauer, in their botanical examinations of New Holland, they will unquestionably be delineated, in the work which the public so eagerly expects from these gentlemen, in a manner which would supersede any other attempts of the kind, especially from dried specimens. I shall therefore confine myself to specific definitions, with such short remarks as may serve merely to assist in distinguishing the genera and species, or to clear up any errors or defects that I may have discovered in my former paper. The new species not mentioned in that paper are distinguished by an asterisk.

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1. PULTENÆA. *Bot. of N. Holl.* 35.

Calyx quinquefidus, bilabiatus, utrinque appendiculatus! *Corolla* papilionacea: alis vexillo brevioribus. *Stylus* subulatus. *Stigma* simplex, acutum. *Legumen* uniloculare, dispermum.

1. P. *stipularis*, foliis linearibus mucronulatis planis subciliatis rectis, stipulis solitariis binervibus laceris patentiusculis.

P. stipularis. *Bot. of N. Holl. t.* 12. *Curt. Mag. t.* 475.

This plant, like all those mentioned, without any particular place of growth, in the following pages, is found near Port Jackson,

son, New South Wales. It is conspicuous for its large heads of handsome yellow flowers, its long, narrow, straight, ciliated, and densely imbricated, leaves, and its very long, tawny, laciniated stipulas, which spread a little from the branches, or, if sometimes pressed to them, are too narrow to embrace or sheathe them like those of the next species.

2. P. *paleacea*, foliis linearibus mucronulatis revolutis apice recurvis, stipulis solitariis binervibus vaginantibus membranaceis laceris.

Much smaller and more branched than the preceding, with small, but very numerous, heads of flowers. The leaves are revolute, silky beneath with close-pressed hairs, but not ciliated, and their points are recurved. The stipulas are dilated, thin, membranous and white, with two brown ribs. They embrace the stem and are very conspicuous, though liable to be injured, and partly obliterated, by time and weather. The long and pointed bracteas reach much higher than the tops of the flowers, which is not so evident in the foregoing.

*3. P. *elliptica*, foliis ellipticis concavis pilosiusculis, stipulis solitariis binervibus villosis imbricatis.

The leaves of this species differ from all other known *Pultenææ* with simple stipulas, in their elliptical form, which nearly approaches that of *P. villosa* hereafter described, and they are also, as in that species, concave above, convex and rough with prominent points beneath. A few long loose white hairs are observable on some of them, chiefly at the margin. The stipulas are, as in the 2 first species, intrafoliaceous, simple, closely pressed to the branches, and so long as to lap over each other; they are elliptical, shaggy with white hairs, furnished with 2 ribs and an

inter-

intermediate furrow. Flowers for the most part so clustered about the tops of the branches as to seem terminal and capitate, but they are really axillary, and some of them are evidently so from the first. By the elongation of the branches all the fruit is lateral. The petals are of a deep yellow. Appendages attached to the base of the calyx, whose teeth are long, slender and hairy.

4. P. *linophylla*, foliis linearibus retusis mucronulatis pilosis, stipulis geminis minutis, bracteis ovatis calyce brevioribus.
   P. linophylla. *Schrad. Sert. Hannov.* 28. *t.* 18.

This flowered in Kew garden in January 1791, for the first time probably in Europe. It has a more upright wand-like habit than *P. paleacea*, with leaves somewhat angular and dilated at their apex, as well as slightly pointed. The minute separate stipulas, and the ovate blunt bracteas, which, instead of surmounting the flowers, are shorter than the calyx, abundantly distinguish it.

5. P. *retusa*, foliis linearibus retusis muticis glabris, stipulis geminis minutis, bracteis ovatis vix longitudine pedunculorum.

Very like the last in habit; but the abrupt, often emarginate, perfectly smooth leaves, not dilated at their apex, mark it at first sight, and the very small bracteas confirm the specific difference. This also was among the very first New Holland plants ever raised in England.

6. P. *daphnoides*, foliis obovatis mucronulato-pungentibus glabris, stipulis geminis minutis, bracteis ovatis calyce brevioribus.
   P. daphnoides. *Andr. Repos. t.* 98.

In size, and beauty of its flowers, this equals or excels the first

first species; in habit and botanical characters it more accords with the two last, as will appear on a comparison of their specific definitions. The name, which more particularly alludes to its resemblance in general form to the beautiful *Daphne collina*, was given by me many years ago, and transmitted by our nurserymen to Germany.

7. P. *flexilis*, foliis obovato-linearibus mucronulatis calycibusque glaberrimis, stipulis petiolo longioribus, racemis terminalibus subfoliosis.

The perfectly smooth-sided calyx distinguishes this species from all the rest. The flowers are not capitate as in nearly all the foregoing, but grow in short terminal *racemi*, more or less accompanied by leaves, and always by real stipulas, at the insertion of their partial stalks, though quite destitute of bracteas. The presence of stipulas, and sometimes of leaves, proves the *racemi* to be but of a spurious kind, approaching to the axillary, and perfectly lateral, inflorescence of the following.

8. P. *villosa*, foliis ellipticis concavis cauleque pilosis, floribus axillaribus solitariis.
P. villosa. *Curt. Mag. t.* 967.

A dense bushy shrub, with numerous short leafy branches, and copious axillary solitary flowers of an uniform yellow. The leaves are short, elliptical, concave, pointless, clothed with prominent hairs, and the branches are more densely villous. The stipulas are longer than the footstalks, and often connate. No bracteas are observable. The appendages grow from towards the base of the calyx, and are longer than its tubular part, having a more leafy appearance than in any other species of *Pultenæa*.

2. AOTUS.

2. Aotus. *Ann. of Bot. v.* 1. 504.

Calyx quinquefidus, bilabiatus, simplex. *Corolla* papilionacea: alis vexillo brevioribus. *Stylus* filiformis. *Stigma* obtusum. *Legumen* uniloculare, dispermum.

1. A. *villosa*. *Curt. Mag. t.* 949.
Pultenæa villosa. *Andr. Repos. t.* 309.
P. ericoides. *Ventenat Jard. de la Malmaison, t.* 35.

I have hitherto met with no other species of *Aotus* than this. The genus itself has, since its publication, received the sanction of the most able botanists, and, amongst others, of the present intelligent editor of the *Botanical Magazine*. I need not here repeat the reasons which first led me to establish it, nor do they require to be supported by any new ones. The calyx is two-lipped in *Aotus* as well as in *Pultenæa*.

3. Gompholobium. *Tr. of Linn. Soc. v.* 4. 220.

Calyx campanulatus, simplex, quinquepartitus. *Corolla* papilionacea. *Stigma* simplex. *Legumen* ventricosum, sphæricum, uniloculare, polyspermum.

1. G. *grandiflorum*, foliis ternatis linearibus mucronatis rectis, ramulis angulatis glabris, carinâ imberbi.
G. grandiflorum. *Exot. Bot. t.* 5.

The leaflets are extremely narrow, rigid, with a straight pungent point. Flowers large and handsome, of a bright uniform yellow.

2. G. *latifolium*, foliis ternatis obovato-oblongis planis venosis, ramulis angulatis glabris, carinâ fimbriatâ.
G. latifolium. *Ann. of Bot. v.* 1. 505. *v.* 2. 519.

G. fimbriatum. *Exot. Bot. t.* 58.

G. psoraleæfolium. *Salisb. Parad. t.* 6.

The flowers of this are even more large and handsome than those of the preceding, and their strongly fringed keel affords an excellent specific character. The leaflets also are much broader, truly *obovato-oblonga* though varying in bluntness, and veiny on both sides. They are tipped with a minute straight point. I gladly accede to the decision of Mr. Dryander, who has adopted my original name *latifolium*, in preference to *fimbriatum*, given on the report of a much broader-leaved species in Kew garden, which perhaps is erroneous.

*3. G. *scabrum*, foliis ternatis linearibus scabris subaduncis muticis, ramulis teretibus pubescentibus.

Found by Mr. Menzies near King George's Sound on the west coast of New Holland. Its leaflets are rough with minute callous points, and not above half an inch long. Flowers axillary, situated towards the summits of the branches, about half the size of the first species, with a somewhat downy-edged, but not fringed, keel. Their colour in the dried specimen is purplish, the wings and keel being of a darker redder hue than the standard; but I dare not from thence judge of their colour when living, as some flowers of this tribe are subject to very extraordinary changes in drying. The *Daviesiæ* in general lose all the yellow of their petals by that process, retaining only a rich purple hue, which is crimson in the fresh plant. The same thing may happen in this *Gompholobium*.

The G. *maculatum* of Andrews's *Repository, t.* 427, seems most akin to this species, though apparently sufficiently distinct. Not having seen a specimen, I decline attempting a definition of it from the drawing only.

4. G. *mi-*

4. G. *minus*, foliis ternatis linearibus lævibus aduncis mucronatis, ramulis teretibus hirtis, carinâ nudâ.

This has the habit of the last, and is nearly of the same size. Its flowers are unquestionably yellow. The recurved points of the leaves mark it at first sight. The flowers are terminal and handsome.

5. G. *pinnatum*, foliis impari-pinnatis multijugis lævibus, caule tereti flexuoso glabro.

I have seen but one specimen of the present species, gathered by Dr. White near Port Jackson, and that has only flower-buds and ripe fruit. I can therefore say nothing of the corolla. The plant is small, and seemingly annual; its stem branches from the bottom, and the species is distinguished from all the rest of its genus, and indeed of the whole tribe under consideration, as far as I have any information, by its pinnated leaves, which, nevertheless, evidently and strictly accord in habit with those of the other species of *Gompholobium*.

The name of this genus applies to the tumid shape of the legume, which swells, from a narrow base, upward; according to the primary signification of γομφος, a word thence used to express a club, a wedge, or any thing formed on a similar principle.

4. Chorozema. *Labillardiere's Voyage*, v. 1. 405.

Calyx quinquefidus, bilabiatus. *Corolla* papilionacea. *Stigma* simplex. *Legumen* oblongum, ventricosum, uniloculare, polyspermum.

1. C. *ilicifolium*, foliis alternis oblongis pinnatifido-dentatis spinosis, racemis terminalibus.
   C. ilicifolium. *Labillard. Voy.* v. 1. 405. *t.* 21.

 C. nanum.

C. nanum. *Curt. Mag. t.* 1032.
Pultenæa nana. *Andr. Repos. t.* 434.

M. Labillardiere originally discovered this plant on the south-west coast of New Holland, at the foot of the mountains, in a loamy soil, near a spot where, after being tantalized with finding many salt springs, his party had just met with an ample supply of fresh water. This welcome refreshment, of which he speaks feelingly in his book, seems to have suggested a name for his plant, which he had properly determined to constitute a new genus. He called it *Chorizēma*, evidently, as I presume, from χορος a dance, or joyful assembly, and ζεμα a drink, in allusion to the circumstance just mentioned. This occasioned me to take the liberty of changing the gender of the name, which he had made feminine, and I have taken the further liberty of changing the *i* for an *o*, an alteration which the derivation seems to authorize, and indeed to render indispensable. I trust I shall now be justified in the eyes of my friend Dr. Sims, see *Curt. Mag.* 1032, whose ingenious derivation of the word in question from ζημια a mischief or punishment, "from the inconvenience its spinous leaves must occasion to the naked-footed dancers of that country," would have seemed very probable, had there been nothing to guide us to the other; but in that case the name must have been *Chorozēmia*, as well as of the feminine gender.

I have never seen a specimen of *Chorozema nanum*, but from the figures and descriptions I find no solid specific distinction between that and the *ilicifolium*. If I am wrong, I shall be glad to be corrected. My specimens of the latter were gathered by Mr. Menzies, near King George's Sound, on the west coast of New Holland, latitude 35 south.

2. C. *tri-*

2. C. *trilobum*, foliis suboppositis hastato-trilobis integris dentatisve spinosis, racemis axillaribus folio brevioribus.
Pultenæa ilicifolia. *Andr. Repos. t.* 320.

This species, brought from Port Jackson, New South Wales, is evidently nearly akin to the preceding, both in characters and habit. The leaves indeed are generally, but not very strictly, opposite, nor can any generic difference be presumed from such a circumstance in a New Holland plant. The spinous stipulas of a *Chorozema* can never be mistaken, nor can any genus be more natural. The leaves of all the known species are simple, and reticulated with numerous veins, being on the whole broader than those of any other genus of this family.

3. C. *scandens*, foliis suboppositis ellipticis indivisis, racemis terminalibus elongatis, calyce pilosiusculo.

The stem is twining; its branches terminated by loose pendulous bunches of yellow flowers, variegated with red, whose calyx is slightly besprinkled with short close-pressed hairs. The leaves are, as in the last, not constantly nor strictly opposite; they are smooth above, and nearly so beneath; their margin wavy and somewhat crenate. I received specimens of this species from Dr. White at Port Jackson, but have never seen it in any garden, nor is it, I believe, any where figured.

*4. C. *sericeum*, foliis subalternis ellipticis, racemis axillaribus longitudine foliorum, calyce sericeo, vexillo angustato.

Gathered at King George's Sound by Mr. Menzies. The twining stem is like the last, but the leaves are more decidedly alternate, except at the extremities of some short lateral branches: they are also rather more coriaceous and wavy, and more silky at the back. The flowers are widely different, thrice as large,

growing

growing 3 or 4 together in slender loose axillary clusters, on silky stalks, each cluster not longer than its corresponding leaf. The calyx is large, campanulate, and beautifully silky with innumerable close-pressed hairs. The shape of the petals can but imperfectly be determined by my specimen, and their proper colour not at all, they being at present of an uniform brown; but the standard seems unusually small and narrow, and the keel proportionably large, which may in this case assist the specific distinction, but not interfere with the generic character, so clearly stamped in every other part. I have not seen the fruit either of this or of *Chorozema scandens;* but their germens are clothed with dense bristles, longer than the silky hairs observable in the two first species.

*5. C. *coriaceum*, foliis elliptico-subrotundis retusis coriaceis sparsis, umbellis axillaribus pedunculatis, calyce hirsuto.

Found also by Mr. Menzies at King George's Sound. This is a stout, upright, firm and rigid shrub, whose branches appear to be ternate, and whose leaves are peculiarly thick and coriaceous. Their apex is deeply emarginate, with a scarcely perceptible blunt point; their margin cartilaginous, somewhat inclined to be revolute; their under side finely silky; their upper smooth, beautifully reticulated with innumerable interbranching veins, more prominent than in the two last species. The flowers grow in dense axillary umbels, on silky stalks, much shorter than the leaves. The calyx is densely clothed with long loose hairs. The style is somewhat dilated and flattened, which circumstance is, though less conspicuously, observable in the last. The stigma however is not at all dilated, but of the simple form proper to the genus. A reconsideration of this part in all the species has induced me to leave out the word *acutum* in the generic cha-

racters

racters of *Chorozema* and *Gompholobium*, as applying less correctly to these genera than to *Pultenæa* and *Daviesia*. The more we study any *papilionaceous* plants, the more we shall be aware of the importance of this part, on which Linnæus has so much depended, in defining their generic characters.

5. DAVIESIA. *Tr. of Linn. Soc. v.* 4. 220.

Calyx angulatus, simplex, quinquefidus. *Corolla* papilionacea. *Stylus* subulatus. *Stigma* simplex, acutum. *Legumen* compressum, monospermum.

1. D. *acicularis*, foliis linearibus revolutis pungentibus strictis denticulato-scabris, floribus axillaribus solitariis.

A hard rigid branching shrub, with very numerous scattered spinous leaves, about an inch long, all linear, rough to the touch, narrow, revolute, except a few of the first upon seedling plants, which are lanceolate and nearly flat. The flowers are copious, axillary, solitary, on very short stalks with a few concave smooth bracteas. Calyx bell-shaped, divided half way down into 5 teeth. Corolla yellow variegated with crimson, but, in drying, the yellow changes to white, and the crimson becomes purple, as appears to be the case in this whole genus. The pods are remarkable, of a semiovate form, pointed, chesnut-coloured, and so highly polished as to seem varnished; they are twice as large as the flowers. On a careful examination a pair of minute awl-shaped stipulas are found, one on each side of the insertion of the leaf, which I had hitherto overlooked, nor can I find any, except in one species, besides.

*2. D. *incrassata*, foliis cuneato-linearibus compressis verticalibus obliquis incrassatis spinosis, floribus axillaribus solitariis.

This most singular, and hitherto nondescript, species was dis-

covered

covered by Mr. Menzies near King George's Sound. Its whole habit is thick and clumsy, its leaves and young branches being apparently succulent when fresh. The insertion of the former is peculiar, their base being perfectly decurrent, and, as it were, incorporated with the branch, without any traces of a footstalk, or any other mark of separation. They are scattered, vertical, compressed, recurved, linear, more or less dilated upward into a sort of protuberance or angle on the upper edge, the lower running in a straight line to the spinous point. The surface is every where rough to the touch, but not hairy nor denticulated. Flowers few, axillary as in the foregoing, apparently yellow. The stem is woody and very much branched.

3. D. *ulicina*, foliis lanceolatis planis pungentibus strictis lævibus, floribus axillaribus solitariis.
D. ulicifolia. *Andr. Repos. t.* 304.

A very bushy shrub, with sessile, not decurrent, small lanceolate smooth leaves. The flowers, with their stalks and bracteas, are similar to those of the first species, but rather smaller. The branches are roughish.

*4. D. *reticulata*, foliis lanceolatis pungentibus utrinque reticulato-venosis, stipulis intrafoliaceis geminis, floribus axillaribus solitariis.

A branching shrub, seemingly of humble growth, found by Mr. Menzies at King George's Sound, and very remarkable at first sight for its beautiful leaves, which are prettily reticulated on both sides with yellow interbranching veins, disposed with peculiar neatness and regularity. It is however far more remarkable, when accurately examined, for the presence of a pair of small intrafoliaceous stipulas, resembling those of *Pultenæa linophylla*

phylla and its more immediate allies, which are of so much importance in the present case, that I feared, at first discovering them, they might, in some measure, invalidate the genus of our plant. The bracteas also resemble those of a *Pultenæa*, being silky at their backs, and closely imbricated round the base of the almost sessile flower. The calyx however is simple, and best agrees with *Daviesia*, as does the aspect of the leaves and of the corolla. The stipulas moreover connect this species with *D. acicularis*, the only species besides in which I can find traces of such appendages. The stigma is perfectly acute; and the germen, in the only flower I have been able to dissect, so small and round, that it evidently accords better with the present genus, than with the oblong many-seeded fruit of *Chorozema*, to which I have had some suspicion that this plant might belong. Those who may have an opportunity of ever seeing the ripe fruit, must finally settle the point. The germen is so beset with bristles, that nothing can be discovered concerning its structure or contents.

5. D. *squarrosa*, foliis cordatis pungentibus reflexis margine scabris, pedunculis axillaribus unifloris subsolitariis.

The slender compound wand-like branches of this shrub are furrowed and rough, densely clothed from top to bottom, with small, scattered, sessile, reflexed, rigid, heart-shaped leaves, having a thickened rough edge, and a spinous point. Almost every leaf is accompanied by one, rarely two, slender, axillary, smooth, simple flower-stalks, each about as long as the leaf, with a few concave round bracteas at its base, and bearing one little flower, variegated, as it appears, with yellow and red. The calyx is obscurely two-lipped, inasmuch as there is rather less distance between the two upper teeth than between any other two.

two. I have not seen the ripe legume, nor any living specimen of this or the five following species.

6. D. *umbellulata*, foliis lanceolatis planis pungentibus, pedunculis axillaribus solitariis umbellatis subquadrifloris, calyce truncato.

Akin to the last in habit, but the leaves are much longer and not reflexed; they are also nearly, if not quite, smooth. Each is accompanied by one axillary flower-stalk, shorter than the leaf, clothed with a few minute scattered bracteas, and bearing an umbel, with several larger bracteas at its base, of generally 4 flowers, much like the foregoing, except that the upper lip of the calyx is singularly truncated and not cloven.

7. D. *corymbosa*, foliis lineari-oblongis planis muticis, pedunculis axillaribus geminis corymbosis multifloris, calyce regulari.

The leaves are 5 or 6 inches long, resembling those of several simple-leaved New Holland *Mimosæ*, somewhat oblique, smooth, entire, acute, but without any terminal spine. I am not very clear whether there be any rudiments of stipulas or no. Flower-stalks axillary, in pairs, corymbose, rather unequal, one being earlier than the other, neither of them so long as the adjoining leaf. They bear a few scattered concave bracteas, as well as one under each partial stalk, and they terminate in 10 or 12 such single-flowered stalks, somewhat scattered, a few of the uppermost only being umbellate, and all together forming a sort of *corymbus*. The flowers are, in a dry state, white variegated with purple; but their original colours are, probably, like those of other species of *Daviesia*, yellow and crimson. The calyx-teeth are short, and all as nearly equal and regular as they can be in a papilionaceous flower. This plant was found by Col. Paterson,

near

near Hawksbury river, New South Wales, and I received it from Sir Joseph Banks's collection.

*8. D. *cordata*, foliis cordatis amplexicaulibus reticulato-venosis, pedunculis axillaribus aggregatis corymbosis multifloris, calyce truncato.

The large heart-shaped leaves, 3 or 4 inches long, clasping the very angular stem, and strongly reticulated on both sides with innumerable veins, sufficiently distinguish this species, which was found by Mr. Menzies at King George's Sound. Four or five corymbose flower-stalks, shorter than the leaf, grow from each *axilla*. The bracteas at the bottom of each *corymbus* are broad, and often heart-shaped; the rest oblong. The 2 upper teeth of the calyx are combined and truncated, as in *D. umbellulata*, and the edge of the calyx, betwixt the teeth, is minutely downy.

*9. D. *alata*, caule aphyllo alato, umbellis lateralibus, calyce bracteisque fimbriatis.

In this singular species, found by Dr. White near Port Jackson, the stem has the habit of a *Genista*, being, at least in the adult state of my specimen, destitute of leaves, and winged throughout in 3 directions; the wings smooth, entire, about a line in breadth, tapering down to the base of each branch, and interrupted here and there by buds, scattered, in an alternate manner, sparingly along the branches. Several of the upper buds produce small solitary umbels, of about 5 flowers each, on short stalks, whose base bears a few small concave bracteas, and whose upper part, at the umbel, is furnished with several much larger ones, curiously jagged or fringed. The calyx-teeth, which are elongated and taper-pointed, all nearly equal and regular,

are fringed at their sides precisely in the same manner. Their edges seem to be deeply coloured with red or purple.

*10. D. *juncea,* caule aphyllo tereti sulcato nudo, umbellis lateralibus, calyce bracteisque imberbibus.

Related to the last in habit, but very distinct. The adult stem is leafless, much and alternately branched, rushy, round, longitudinally furrowed, roughish to the touch. Umbels from a few lateral buds towards the ends of the branches, solitary, simple, nearly sessile, each of about 4 flowers. Bracteas remarkably concave, pale brown, ribbed or furrowed; the uppermost largest, the lower ones closely imbricated; all destitute of a marginal fringe. Calyx nearly regular, with 5 short teeth, whose edges, seen under a microscope, are finely downy, but not jagged nor fringed. This was discovered at King George's Sound by Mr. Menzies. The colour of the petals in these two last species seems nearly to accord with all the foregoing.

It cannot but be very satisfactory to the author of any genus to find it confirmed by the acquisition of new species, especially when its name commemorates a meritorious friend. Five hitherto unknown species of *Daviesia* are here added to the original five whence the characters were taken, and they all together form a most natural assemblage. Linnæus observes, *Philos. Bot. sect.* 170, "rarò observatur genus in quo pars aliqua fructificationis non aberrat." Of this the calyx in the genus before us affords a striking exemplification, being in several species deeply and equally five-toothed, and almost perfectly regular; in others as distinctly 2-lipped, the upper lip singularly truncated, and either cloven with a rounded *sinus,* or only slightly emarginate. These differences occur in species otherwise most akin to each other.

6. Vimi-

6. VIMINARIA. *Annals of Bot. v.* 1. 507.

Calyx angulatus, simplex, quinquefidus. *Corolla* papilionacea. *Stylus* capillaris. *Stigma* simplex, acutum. *Legumen* coriaceum, farctum, evalve, monospermum.

1. V. *denudata.* *Exot. Bot. t.* 27.
Daviesia denudata. *Ventenat Choix, t.* 6.
Sophora juncea. *Schrad. Sert. Hannov. t.* 3.

On reconsidering this genus, of which only one species is known, I think the capillary style affords an additional mark of discrimination. The calyx-teeth are short, all nearly equal and uniform. The legume is clearly distinct from all others of this tribe.

7. SPHÆROLOBIUM. *Annals of Bot. v.* 1. 509.

Calyx quinquefidus, bilabiatus. *Corolla* papilionacea. *Stigma* carinatum, membranaceo-dilatatum! *Legumen* pedicellatum, turgidum, obliquum, subdispermum. *Stamina* duo suprema distantia!

1. S. vimineum. *Ann. of Bot. v.* 1. 509. *Sims in Curt. Mag. t.* 969.

Dr. Sims, the first scientific botanist who had an opportunity of examining this plant alive, found that the young branches, before they flower, are clothed with small, scattered, lanceolate leaves; and I have since detected the rudiments of such a branch among my specimens. The same gentleman found 2 seeds usually in each legume, and I have corrected the generic character accordingly. I need not repeat my original remarks on the genus, of which this is the only known species.

8. DILL-

8. DILLWYNIA. *Annals of Bot. v.* 1. 510.

Calyx quinquefidus, bilabiatus. *Corolla* papilionacea. *Stylus* recurvus, germine brevior. *Stigma* obtusum, pubescens! *Legumen* ventricosum, uniloculare, dispermum.

1. D. *ericifolia*, foliis linearibus tortis punctulato-scabris, floribus subterminalibus.

   D. ericifolia. *Exot. Bot. t.* 25.

A rigid shrub, with copious clustered branches, covered when young with dense prominent pubescence, and clothed with numerous, scattered, spreading leaves, on short footstalks, with a pair of obsolete gland-like stipulas at the base of the stalk. Each leaf is about half an inch long, linear, twisted half round, rough all over with minute points, acute and somewhat pungent; the under side convex, but not keeled; the upper marked with a longitudinal furrow. Flower-stalks clustered about the summits of the branches, rarely lateral, with several concave bracteas at their base, and a pair towards the middle of each. Calyx bell-shaped, two-lipped, angular at the base, fringed at the edge: its upper lip of 2 divaricated, oblique, deflexed segments; its under of 3, nearly equal, rather smaller ones, of which the 2 lateral have hooked deflexed points. Petals of a full permanent yellow; the standard very broad, short and cloven, with a crimson, radiating, central spot. Legume ovate, turgid, rather hairy, terminated by the thick permanent style, about a quarter as long, which is also hairy at the base, smooth and recurved towards the end.

2. D. *floribunda*, foliis linearibus subtortis tuberculato-scabris, floribus lateralibus axillaribus.

   D. floribunda. *Exot. Bot. t.* 26.

The leaves are less spreading than in the former, as well as

rather

rather broader, and essentially different in being covered with coarse callous tubercles. We have what seems a variety, in which the leaves are much thicker, so convex beneath as to be almost cylindrical, and scarcely twisted at all. No stipulas are discernible in this species. The flowers are copious, lateral, axillary, solitary, on short bracteated stalks, and resemble the foregoing, except that the standard is not quite of so broad a proportion. Legume very hairy, crowned with the smooth hooked style.

3. D. *glaberrima*, foliis linearibus rectis carinato-triquetris lævibus, floribus terminalibus confertis.

A slender humble shrub, with rather longer leaves, which are very smooth, marked, like both the former, with a furrow on the upper side, but distinguished by their triangular keel. Two minute awl-shaped stipulas are just discernible at the base of each foot-stalk. The flowers in the dried specimens much resemble those of *D. ericifolia*, and are likewise clustered about the tops of the branches. I have never seen them fresh. These three species are all brought from Port Jackson, and all strictly agree in habit as well as fructification.

*4. D. *myrtifolia*, foliis decussatis obovatis concaviusculis subquinquenervibus lævibus, floribus axillaribus.

This species, found by Mr. Menzies at King George's Sound, differs from all the foregoing in its foliage, but strictly agrees in the parts of the flower. The branches are smooth and angular. The leaves opposite, crossing each other in pairs, like those of *Veronica decussata*, with which they nearly agree in size, but are obovate, with a straight pungent point, smooth, entire, somewhat concave, with 3 tolerably conspicuous, and 2 less evident, longitudinal

longitudinal ribs. Their upper side, in a dry state, is of a palish opaque green; the under of a dark purplish hue, almost black, but in some degree shining. Footstalks broad and very short. Stipulas very small, ovate, minutely fringed. Flowers axillary, solitary, on shortish stalks, with 2 or 3 pair of oblong bracteas. Calyx precisely like that of all the foregoing. Petals apparently deep yellow, with a pale lemon-coloured spot, surrounded with red, at the base of the standard. I have not seen the fruit.

*5. D. *glycinifolia,* foliis ovatis linearibusque revolutis reticulatis, floribus racemosis.

Some difficulties attend the determination of the genus of this plant, which is one of those from King George's Sound given me by Mr. Menzies. In habit it accords with none of the foregoing genera nor species, but might rather be taken for a simple-leaved *Glycine.* The stems are weak, seemingly decumbent, about a foot long, branched, smooth, angular upwards. Leaves scattered, on short thick footstalks, coriaceous, reticulated, pungent, revolute, entire, paler and often hairy beneath; the upper ones linear, an inch or more in length and a line in breadth; the lower much broader, shorter and ovate. Stipulas minute, awl-shaped, rigid. Flowers in longish, loose, terminal clusters, often accompanied by similar axillary clusters from 2 or 3 of the uppermost leaves. Bracteas small, scattered, ovate. Flower-stalks and calyx clothed with scattered, white, close-pressed hairs. Calyx bell-shaped, very slightly angular at the base, its teeth nearly as long as the tube, lanceolate, almost equal and uniform, but the 2 uppermost are united half way up, rendering the calyx distinctly 2-lipped, and they are moreover so divaricated and oblique, as to indicate the character of a *Dillwynia.* The dried petals are purplish; the standard short and broad,

pale

pale at the base. Germen bristly. Style so recurved as almost to form a circle, not straight at the base, and then suddenly hooked, as in the genuine *Dillwyniæ*. Stigma capitate, downy. I have not seen the fruit. It is to be suspected the legume may prove different from that of a *Dillwynia*, and in conjunction with the peculiarity above mentioned in the style, as well as in the habit, may establish this plant as a new genus. Its leaves and stipulas approach those of a *Chorozema*.

9. Mirbelia. *Annals of Bot. v.* 1. 511.

Calyx quinquefidus, bilabiatus. *Corolla* papilionacea. *Stylus* recurvus, basi crassissimus, germine brevior. *Stigma* capitatum. *Legumen* ventricosum, biloculare! dispermum.

1. M. *reticulata. Ann. of Bot. v.* 1. 511. *Ventenat Malmais. t.* 119. Pultenæa rubiæfolia. *Andr. Repos. t.* 351.

This, the only species hitherto discovered of its genus, has a much-branched spreading stem, opposite or ternate leaves about an inch long, and neatly reticulated. Its blueish flowers, growing in short axillary clusters, are no less peculiar in this tribe. But, above all, the essential generic character of the 2-celled legume is remarkable. These cells are formed, as M. Ventenat has recently observed, by membranous partitions, equally originating from each suture, and not, as in *Astragalus*, by an imperfect extension of one suture only. Nevertheless, even *Mirbelia* forms no exception to the rule that a *legumen* has never any separate and distinct longitudinal partition, like that of a *siliqua*: from which such spurious partitions, produced by the inflexion of the valves, are materially different, as the celebrated Jussieu has shown in the characters of his *Rhodoraceæ* and *Ericineæ*. See *Annals of Bot. v.* 2. 561.

10. CALLISTACHYA. *Ventenat Malmais.* 115.

Calyx quinquefidus, bilabiatus. *Corolla* papilionacea. *Stigma* simplex. *Legumen* pedicellatum, lignosum, multiloculare polyspermum.

*1. C. *lanceolata*, foliis lanceolatis acutis, racemo terminali.
C. lanceolata. *Ventenat Malmais. t.* 115.

This new genus, which I am happy to add to my list on the authority of M. Ventenat, appears clearly distinguishable from all the rest by its fruit, which according to that writer is a woody legume, opening only at its summit, and separated by membranous transverse partitions into several cells, each containing 1 seed. I have presumed to change the termination of the name, to avoid the fault, always, if possible, to be guarded against, of compounding it of one already established, *Stachys;* see *Introduction to Botany*, 387, and *Linn. Philos. Bot. sect.* 225.

I have never seen a specimen of this plant, any more than of the second species mentioned by the same learned author, of which he gives the following specific character only, having never seen the flowers.

*2. C. *elliptica*, foliis ellipticis obtusis. *Vent. loc. cit.*

Both plants are natives of New Holland, and would doubtless have been taken by superficial botanists for *Crotalariæ.* The plate and description in M. Ventenat's work have helped me to understand another plant, brought by Mr. Menzies from King George's Sound, and which I venture to propose as a third species of *Callistachya.*

*3. C. *cuneifolia*, foliis cuneiformibus emarginatis, pedunculis axillaribus solitariis folio longioribus.

This is a dwarf herbaceous plant, 2 or 3 inches high, appa-

rently annual, with somewhat of the habit of a *Lotus*. The leaves are alternate, on long footstalks, wedge-shaped, slightly hairy, entire, except at the summit, where they are emarginate, with a minute intermediate point, and rounded. Stipulas in pairs attached to the base of the footstalk, lanceolate, pointed, membranous, recurved, exactly agreeing with those figured and described by M. Ventenat in the above species. The inflorescence however is different, but that leads in this tribe not even to a suspicion of a generic distinction; witness *Pultenæa* and *Daviesia*. The flower-stalks in the plant before us are axillary, solitary, very long, much exceeding their correspondent leaves, hairy and single-flowered, with a pair of lanceolate hairy bracteas near the calyx. Flowers large and handsome. Calyx hairy, its upper lip cloven, not half way down, into 2 rounded lobes; its lower deeply divided into 3 lanceolate acute segments. Standard rounded, large, apparently yellow like the wings, streaked with red or purple; the keel seems to be entirely purple, slightly fringed with white. Germen long and very hairy. Style ascending like the stamens, and all together filling the cavity of the keel. Stigma obtuse, rather more inclined to be capitate than M. Ventenat represents it in his plant. I have seen nothing of the fruit, and therefore should never have ventured to describe this plant as a new genus, though unable to reduce it to any known one, had not M. Ventenat elucidated the subject by his publication of the other species.

 XIX. *On*

XIX. *On the Variegation of Plants. In a Letter to Richard Anthony Salisbury, Esq. F.R.S. and L.S. by Thomas Andrew Knight, Esq. F.R.S. and L.S.*

Read March 15, 1808.

MY DEAR SIR,

Though variegated plants have long occupied the care and attention of the gardener, it does not appear that the peculiarities which distinguish them have much attracted the attention of the naturalist; and I am not acquainted with any experiments which have been made either to discover the cause of variegation, or the effects produced by it. I am therefore induced to trouble you with an account of a few experiments which I have made on one species of variegated plant, from which I obtained an unexpected and somewhat interesting result.

There is a kind of variegated vine, well known to gardeners (the Aleppo), which affords variegated leaves and fruit; and as the grape, though small, possesses a very high flavour, and much richness, I wished to obtain some offspring either from its seeds or farina, with the hope of procuring berries of larger size, and at the same time of ascertaining whether its variegation would be transferred to the offspring.

With this object in view I extracted the immature stamina of the blossoms of the White Chasselas, and White Frontignac vines; and at the proper subsequent period I introduced the farina of the Aleppo vine: from this experiment I obtained, in

in the succeeding spring, many seedling plants. These plants, which were raised in a hot-bed, presented no singularity of character on their first appearance; but early in the succeeding summer I had the pleasure to observe purple stripes in the seed-leaves of several of them; and in the autumn the leaves of many were variegated. I did not however obtain a single plant which promised to produce, or has subsequently afforded, either coloured fruit, or coloured leaves, free from variegation.

When, on the contrary, I have introduced the farina of a black, or purple grape into the blossom of a white one, none of the plants I obtained have ever been variegated; and the colour of the leaves and fruit, which these in the first year afforded, indicated with certainty the colour of all the produce of such varieties, in whatever soil cuttings taken from them were subsequently planted. But in the variegated vines the result has been wholly different; and though the leaves and fruit first produced by some of them contained more tingeing matter than any of the coloured kinds, they subsequently produced, even on the same tree, some bunches almost entirely black, others perfectly white, others lead-coloured with stripes of white, and others white with minute black stripes; and grapes of all the preceding colours are very frequently seen on the same cluster. The leaves are also subject to the same variations, and the colours in them are in some instances confined to the *upper*, in others to the *under* surface, and sometimes extend quite through; and both the leaves and fruit of some of the branches have become permanently colourless.

It appears therefore obvious, that the tingeing matter of variegated grapes, though probably not essentially different from that of others, is differently combined, and united to the plant; and as the variegated grape afforded offspring similar to itself, and

none

none similar to other vines, which permanently afford coloured fruit, it may be confidently inferred, that the nature of the union between the tingeing matter and the plants is very essentially different.

All the variegated plants that I obtained from the farina of the Aleppo vine, are not only perfectly free from disease and debility of every kind, but many of them possess a more than ordinary degree of hardiness and vigour; and two of them appear much more capable of affording mature fruit, in the climate of England, than any now cultivated. It is therefore sufficiently evident that the kind of variegation which I have described is neither the offspring of, nor connected with, disease or debility of any kind. But the same inference must not be drawn respecting other variegated plants; for variegation itself appears to consist of several distinct kinds. The leaves of a variety of the common cabbage are often seen, in the cottage garden, curiously tinged with different shades of red and purple, like the leaves of the vines which I have described: but in the cabbage these colours combine and melt into each other, whereas in the vines the distinct colours are separated by well defined lines. The colours of the cabbage are transferred to its offspring, which is perfectly hardy and vigorous.

The spotted lettuce must also be classed with variegated plants, and the offspring of this is as hardy as those of other varieties: but the most common kind of variegation, in which the leaves are variously striped with white and yellow, though not the offspring, as some writers have imagined, of disease, is, however, closely connected with some degree of debility; possibly owing to the imperfect action of light on all such parts of the leaves as are either white or yellow. For I have observed that variegated hollies are less patient of shade than such as are

wholly

wholly green; and I have never seen any plants, the leaves of which are wholly white or yellow, that continued to live beyond a single season. A variegated plant of the raspberry, which sprang from seed in my garden, became wholly white in the third year; but it perished in the succeeding winter, and I should be disposed to conclude that plants whose leaves are entirely white or yellow, cannot long survive; but that Du Hamel* has described a variety of the peach tree, of which he says, "son bois, ses feuilles, ses fleurs, et son fruit, tant extérieurement qu'intérieurement, sont tout à fait blancs." This variety is at present, I believe, wholly unknown to our gardeners; and I suspect that it was always a debilitated plant, and that it in consequence exists no more. I am, &c.

Thomas Andrew Knight.

* In his Treatise on Trees.—*Article* Peach Tree.

XX. *Charac-*

XX. *Characters of Hookeria, a new Genus of Mosses, with Descriptions of Ten Species.* By *James Edward Smith, M.D. F.R.S. P.L.S.*

Read April 5, 1808.

Since the publication of a paper on the *Generic Characters of Mosses, and particularly of the Genus Mnium*, in the 7th volume of our Transactions, an excellent treatise on the same subject, more especially respecting *Orthotrichum* and *Neckera*, by Dr. Mohr of Kiel, has appeared in the last fasciculus of the *Annals of Botany*, of Dr. Sims and Mr. Konig; a publication whose discontinuance I always find fresh reason to lament, whatever botanical subject I touch upon. The able cryptogamist, to whom we are obliged for this treatise, tries all the genera of which he has occasion to speak, by the Linnæan rule "*genus dabit characterem*," and the result is no less in favour of his acuteness than of the excellence of the rule. In order to characterize genera which nature shows by their habit to be distinct, he has paid more attention to the form and structure of the *calyptra* than any preceding writer, and I think with good success. He expresses some "doubts of the propriety of having "recourse to the form and structure of the capsules of mosses "in forming their generic characters," lest it should "oblige us "to divide *Polytrichum* and other genera into several new ones, "and to make more such unnatural alterations." In answer to this, I beg leave to remind him of the rest of the Linnæan rule,

that

that "*the character is not to make the genus;*" a maxim no less important than the other, as guarding against the division of a natural genus, on account of any character whatsoever, and to which Dr. Mohr's own practice is all along no less correctly conformable than to the former part of the said law.

The genus which I have now to propose comprehends, among other species, two mosses never suspected hitherto of being congeners, but both in habit so strikingly alike, that no plants could be expected to form a more natural genus. These are the *Hypnum lucens* of Linnæus, and the *Anictangium bulbosum* of Hedwig. I have hinted in the *Flora Britannica* that the former of these might, even upon the principles of Hedwig, constitute a genus; for in the only dried capsule which I could then afford to dissect, I found the teeth of the inner *peristomium* so short, as to differ greatly in that respect from every Hedwigian *Hypnum* or *Leskea*; but this arose from a partial cohesion. In copious living specimens, brought last February by Mr. W. J. Hooker from bogs near Holt, I have had an opportunity of examining every part of this curious and beautiful moss at leisure. I have, under the microscope in a warm room, seen the fringes in every stage of expansion, and closing suddenly on the admission of moisture, and I find the inner one divided about half way down into 16 regular equal perforated teeth, as in many *Leskeæ*, though far less deeply than in others. This inner membranous fringe is so strongly plaited, that the lower parts of the teeth, in a dry state, often approach one another so as to seem united. Perhaps such a partial cohesion gave an irregularity to its appearance, and induced Dr. Schwægrichen, the editor of the *Species Muscorum*, to make it a *Hypnum*, not a *Leskea*, which last, according to the generic rules of Hedwig, I now find it ought to be. Hedwig appears never to have examined the fructification

tification of this plant at all, though he has figured the leaf with its remarkable terminal radicles. With regard to his *Anictangium bulbosum*, this illustrious muscologist has himself made a greater mistake, in consequence of the young state of the capsules which it fell to his lot to examine, and which seem in that respect much like some preserved in the Linnæan herbarium. In these he could find no fringe, and therefore referred the plant to his *Anictangium.* I had lately however the pleasure of receiving some more perfect ones from my friend Labillardiere, who has figured this moss in his work on New Holland plants, *t.* 253. *f.* 1, by the name of *Leskea pennata.* In these specimens the *peristomium* is sufficiently apparent, and is that of a *Leskea.* Thus these two plants are brought together under one genus, my *Hypnum.* We must next examine how they may together be separated from thence in order to constitute a genus by themselves, which the striking peculiarity of their habit so imperiously requires. This, I think, may with certainty be done, both according to my principles founded on the capsule, as in *Mnium* and *Bartramia*, and according to those of Dr. Mohr, derived from the *calyptra* or veil.

The capsule of both these mosses is all over curiously reticulated or dotted, in a different and more remarkable manner than that of any *Hypnum* known to me. This I think will afford one generic mark. The *calyptra* may, by most botanists, be thought to yield a better distinction, being not only most curiously reticulated, so as in a dry state to be in every part cellular, which I have not seen in any other moss, but it moreover comes off entire, never splitting longitudinally like that of every genuine *Hypnum* that I have had an opportunity of examining. I have not indeed seen this part in all the exotic species hereafter mentioned, but I have no apprehension of its being materially different

ferent from the English one, all other parts of their fructification, as well as habit, agreeing so well as they do.

I have great pleasure in dedicating this genus to my young friend Mr. William Jackson Hooker of Norwich, F.L.S., a most assiduous and intelligent botanist, already well known by his interesting discovery of *Buxbaumia aphylla*, as well as by his scientific drawings of *Fuci* for Mr. Turner's work; and likely to be far more distinguished by his illustrations of the difficult genus *Jungermannia*, to which he has given peculiar attention. The reticulated habit of this his favourite genus accords with what is most remarkable in my *Hookeria.*

To the 2 species already mentioned I am enabled by Mr. Menzies's bounty to add 6 more, as well as 2 from the Linnæan herbarium, of all which I beg leave to offer the following generic and specific characters.

Hookeria.

Cryptogamia *Musci.*

Capsula ovata, reticulato-punctata, e perichætio squamoso, laterali. *Peristomium exterius* dentibus sedecim: *interius* membranaceum, sedecim-dentatum. *Calyptra* celluloso-reticulata, integra.

1. Hookeria *lucens*, foliis trifariis ellipticis uniformibus integerrimis enervibus.

H. lucens. *Engl. Bot. t.* 1902.

Hypnum lucens. *Linn. Sp. Pl.* 1589. *Sm. Fl. Brit.* 1295. *Hedw. Fund. v.* 1. 13. *t.* 1. *f.* 4—6. *Sp. Musc.* 243. *Hoffm. Germ. v.* 2. 56. *Ehrh. Crypt.* 5.

H. pennatum aquaticum lucens, longis latisque foliis. *Dill. Musc.* 270. *t.* 34. *f.* 10.

 Angl.

Angl. Shining Hookeria.

In udis umbrosis et palustribus. ♃.

Most frequent in the northern counties of England. *Dill.* In dark shady woods in Scotland, but not common. *Lightf.* In Sussex. *Dickson.* On Holt heath, Norfolk, in wet places among grass. *Mr. W. J. Hooker.* At Islington near Dartmoor, Devonshire. *Miss Filmore.* In Germany. *Ehrhart,* and *Weber.* At Nootka sound, on the west coast of North America. *Mr. A. Menzies.*

Herba succosa, tenerrima, glaberrima, pellucida, pallidè virens. *Caules* biunciales, cæspitosi, adscendentes, radicantes, simplices vel ramosi, undique foliosi, teretes. *Folia* verticalia, laxè imbricata, subdisticha, at triplici serie plerumque digesta, sessilia, elliptica, obtusiuscula, plana, integerrima, avenia, et enervia, undique pulcherrimè reticulata, interstitiis oblongiusculis; apice quandoque radicantia. *Perichætia* lateralia, solitaria vel gemina, foliolis ovatis, acuminatis, enervibus, concavis. *Pedicelli* solitarii, erecti, foliis quintuplò longiores, rubri, basi bulbosi, apiceque paululùm incrassati. *Capsula* plùs minùs cernua, ovata, brevis, saturatè fusca, nitida, undique concinnè reticulato-punctata. *Operculum* longitudine ferè capsulæ, subulatum, rectiusculum, reticulatum, rufum, basi fimbriatum et annulatum. *Peristomium exterius* e dentibus 16, basi latioribus, extùs fulvis, intùs crebrè denticulatis: *interius* membranaceum, reticulatum, plicatum, pallidè fuscum sive lutescens, ad medium usque æqualitèr dentatum, dentibus 16, subulatis, carinatis, pertusis, emarginatis. *Calyptra* vix operculo major, ampullaceo-conoidea, recta, mucronulata, albida, undique pulchrè reticulata, siccitate cellulosa; basi crenulata, at semper indivisa, et integra e fructu maturo secedens.

2. H. *qua-*

W. J. Hooker delin.

2. H. *quadrifaria*, foliis quadrifariis obovatis subintegerrimis uninervibus; intermediis utrinque brevioribus adpressis.

TAB. XXIII. Fig. 1.

In Australasiâ. ♃.

At Dusky bay, New Zeeland. *Mr. A. Menzies.*

Caules triunciales, subdivisi, adscendentes, undique foliosi. *Folia* quadrifariàm imbricata, obovata, obliqua, mutica, ferè integerrima, vel apice tantùm aliquatenùs denticulata, pulcherrimè reticulata, interstitiis orbiculatis, ultrà medium uninervia, nervo subindè bifurco; majora distichè patentia; minora duplò breviora, rotundiora, adpressa, subalterna, seriem intermediam utrinque constituentia. *Perichætia* axillaria, solitaria, foliolis lanceolatis. *Pedicelli* solitarii, erecti, foliis sextuplò longiores, atro-purpurei, basi bulbosi. *Capsula* cernua, atro-purpurea, angustè ovata, ore dilatata, undique reticulato-punctulata. *Peristomium exterius* aureum: *interius* citrinum. *Operculum* et *calyptra* mihi ignota, nec peristomii structura ex unico exemplari erui potuit.

A, A. *Folia* quadruplò aucta.

3. H. *pennata*, foliis trifariis mucronulatis serrulatis; intermediis duplò brevioribus orbiculatis; reliquis lanceolatis pedicellos superantibus.

Leskea pennata. *Labillardiere Nov. Holl. t.* 253. *f.* 1.

Anictangium bulbosum. *Hedw. Sp. Musc.* 43. *t.* 6. *f.* 1—5.

In Australasiâ. ♃.

In New Holland. *M. Labillardiere.* At Dusky bay, New Zeeland. *Mr. A. Menzies.*

Radices implexæ, repentes, densè tomentosæ, nigro-ferruginеæ,

neæ, nequaquàm bulbosæ. *Caules* 3- aut 4-unciales, plerumque simplices, rariùs bifidi, erecti; basi denudati, nigri, nitidi; supernè foliosi. *Folia* verticalia, laxè imbricata, trifaria; serierum duarum oppositarum disticha, patentissima, lanceolata, inæquilatera, basi uninervia; seriei intermediæ longè minora, arctè adpressa, orbiculata, Jungermanniarum quarundam auriculas simulantia; omnia pellucida, nitida, tenuissimè reticulata, mucronulata, apicem versùs serrulata. *Perichætia* lateralia, solitaria, e foliorum majorum axillis, foliolis lanceolatis, angustis. *Pedicelli* basi insignitèr bulbosi, solitarii, arcuato-deflexi, fulvi, nitidi, foliis majoribus breviores. *Capsula* latè ovata, undique punctulato-reticulata, ferruginea. *Peristomium exterius* fulvum; *interius* flavum. *Operculum* capsulâ brevius, basi conicum, apice tenuissimè subulatum. *Calyptra* mihi ignota*.

4. H. *filiculiformis*, ramis fasciculatis tripinnatis, foliis ovatis trifariis complanatis integerrimis enervibus; intermediis parùm minoribus.

Leskea filiculiformis. *Hedw. Sp. Musc.* 213. *t.* 50.

In plagis australioribus. ♃.

Radix repens, longissima, tortuosa, villosa, fusco-nigra. *Caules* sparsi, erecti, biunciales, simplicissimi, teretiusculi, læves, nudi, apice ramosissimi; ramis fasciculatis, radiatis, complanatis, flabelliformibus, tripinnatis, undique foliosis. *Folia* saturatè viridia, numerosissima, minima, trifaria, distichè complanata, cordato-ovata, acuminata, integerrima, enervia; intermedia reliquis vix minora, arctè adpressa. *Perichætia* subconferta, foliolis majoribus, concavis, carinatis, et, ni fallor, uninervibus. *Pedi-*

* Mr. R. Brown informs me that the *calyptra* of this species, which he has gathered in New Holland, agrees with that of *H. lucens*.

cellus

cellus uncialis, ruber. *Capsula* pendula, ovata, fusca, insignitèr reticulata. *Operculum* non vidi, neque *calyptram.*

5. H. *tamariscina*, ramis fasciculatis, foliis obliquis trifariis serratis uninervibus; intermediis triplò minoribus ovato-lanceolatis.

Leskea tamariscina. *Hedw. Sp. Musc.* 212. *t.* 51. *f.* 1—7.
Hypnum tamarisci. *Swartz. Prod.* 141.

In plagis australioribus. ♃.
In Jamaica. *Dr. Swartz.* At the Cape of Good Hope. *Mr. A. Menzies.*

Radix repens, villosa, nigra. *Caules* sparsi, erecti, unciales, nudiusculi, apice ramosi; ramis fasciculatis, patulis, subdivisis, haud uncialibus, undique foliosis. *Folia* lætè viridia, reticulata, trifaria, ovata, acuminata, serrata, ultrà medium uninervia, omnia siccitate torta; majora obliqua, basi integerrima; intermedia triplò minora, undique serrata, æquilatera. Setas intermedias ab Hedwigio depictas frustrà quæsivimus. *Perichætia* subconferta, foliolis ovatis, acuminatis, concavis, integerrimis. *Pedicellus* haud uncialis, ruber. *Capsula* pendula, ovata, pulchrè reticulata. *Operculum* subulatum, longitudine capsulæ, basi convexum. *Calyptra* reticulata, flavicans, in unico nostro exemplari, casu forsitan, lacera.

6. H. *rotulata*, ramis fasciculatis, foliis trifariis serratis uninervibus; intermediis duplò minoribus orbiculatis basi integerrimis.

Leskea rotulata. *Hedw. Sp. Musc.* 213. *t.* 51. *f.* 8—13.

In Australasiâ. ♃.
In New Zeeland. *Mr. A. Menzies.*

Habitus præcedentis. *Folia* pallidiora, tenuiùs reticulata, latiora, et vix obliqua; intermedia haud duplò minora, apice tantùm,

tùm, longèque quam in priore minùs evidentèr serrata. *Capsula* pallida, valdè reticulata, et, ni fallor, succosa. *Operculum* ferè præcedentis.

7. H. *flabellata*, caule erecto, ramis sparsis pinnatis, foliis distichis complanatis apice serratis.

Tab. XXIII. Fig. 2.

In Indiâ occidentali. ♃.

Communicated to the younger Linnæus by Mr. Dickson, as a native of the West Indies, under the name of *Hypnum flabellatum.*

Præcedentibus duabus triplò major, *caule* infernè simplici, foliis arctè vestito, *ramis* flabelliformibus, distichè pinnatis aut bipinnatis, undique foliosis. *Folia* luteo-virentia, pallida, nitida, bifaria, distichè patentia, complanata, verticalia, elliptica, obliqua, apice tantùm acutè serrata, ad medium usque uninervia. *Perichætia* sparsa, foliolis lineari-lanceolatis, numerosis. *Pedicellus* perichætio vix duplò longior, basi ruber, apice citrinus. *Capsula* ovata, ferruginea, erecta. *Habitu*, nequaquàm verò *peristomio*, *Neckeræ* affinis videtur hæc species.

B. *Rami* portio aucta. C. *Folium* magìs auctum. D. Frustulum *peristomii interioris*, maximè auctum.

8. H. *Arbuscula*, caule erecto, ramis sparsis pinnatis, foliis undique imbricatis concavis muticis integerrimis.

Tab. XXIII. Fig. 3.

In Australasiâ. ♃.

In New Zeeland. *Mr. A. Menzies.*

Præcedenti magnitudine compar, arbusculiformis, *radice* nigrâ, villosâ, *caule* infernè simplici, foliis arctè tecto, *ramis* comosis,

mosis, alternis, approximatis, pinnato-ramulosis, foliosis. *Folia* undique imbricato-patentia, pallidè virentia sive lutescentia, nitida, ovata, concava, obtusiuscula, mutica, integerrima, basi obsoletè binervia, omnia uniformia. *Perichætia* sparsa, foliolis acuminatis. *Pedicellus* semiuncialis. *Capsula* erecta, ovata, ferruginea. Formâ priori, foliorum indole sequenti affinis.

E. *Folium.* F. *Capsula,* sextuplò circitèr aucta.

9. H. *flexilis,* caule elongato flexili folioso, ramis sparsis simplicissimis, foliis imbricatis concavis integerrimis obtusis.

Leskea flexilis. *Hedw. Sp. Musc.* 234. *t.* 58.

Hypnum flexile. *Swartz. Prod.* 141.

In Indiâ occidentali, nec non in Australasiâ. ♃.

In Jamaica. *Dr. Swartz.* At Dusky bay, New Zeeland. *Mr. A. Menzies.*

Caules laxè repentes aut penduli, elongati, flexiles, undique foliosi, *ramis* brevibus, sparsis, simplicissimis, cylindraceis. *Folia* undique imbricata, luteo ac pallidè viridia, nitida, elliptica, concava, obtusa, integerrima, basi obsoletissimè binervia, omnia uniformia. *Perichætia* sparsa, cylindracea. *Pedicellus* haud uncialis. *Capsula* ovata, ferruginea, nitidiuscula, cernua.

10. H. *uncinata,* caule diffuso folioso, ramis sparsis, foliis imbricatis falcato-secundis acuminatis integerrimis enervibus.

TAB. XXIII. Fig. 4.

In Africâ australi. ♃.

At the Cape of Good Hope. *Mr. A. Menzies.*

Habitus *Hypni cupressiformis,* vel potiùs *H. imponentis, Hedw. Sp. Musc.* 290. *t.* 77. *Caules* cæspitosi, *ramis* pinnatis, diffusis, foliosis.

foliosis. *Folia* fuscescentia, arctè imbricata, falcato-secunda, ovata, acuminata, concava, integerrima, enervia. *Perichætia* parva, foliolis subulatis, rectis. *Pedicellus* capillaris, uncialis et ultrà. *Capsula* erecta, clavato-cylindracea, ferruginea, nitida.

G. *Folium.* H. *Perichætii* foliolum. I. *Capsula.* Omnia microscopio aucta.

Norwich, March 4, 1808.

XXI. *De-*

XXI. *Description of Notoclea, a new Genus of Coleopterous Insects from New Holland. By Thomas Marsham, Esq. Tr. L. S.*

Read February 17, 1807.

In the variety of curious insects which I have received from New South Wales, there seems to be a number of new and distinct genera. Of these I have selected, as the subject of the following monograph, a genus which does not appear to me to have been noticed by any author. Even Mr. Donovan, in his last elegant and valuable work of the *Natural History of the Insects of New Holland*, &c. has suffered it to escape his notice. On the first glance the insects of this genus might be taken for *Chrysomelæ*, but on closer examination they will be found to differ from that genus in the shape of the body, and the last joint of the palpi; the antennæ also are more filiform, and the exterior margin of the elytra at the base is angular, and not rounded as in *Chrysomela* and *Coccinella*. The shape of the body and of the exterior palpi gives them a strong resemblance to *Coccinella*, but the antennæ totally exclude them from that genus. The dilated elytra of some specimens, particularly on the under side, claim an affinity with *Cassida*, but in that mark only they agree.

I have named this genus *Notoclea*, from νῶτος, *dorsum*, and κλεῖος, *celebris*, on account of the remarkable form and convexity of the back; and I have formed the generic character from the out-

 ward

ward and visible part of the insect; but for the accommodation of such entomologists as prefer characters from the *Instrumenta Cibaria*, I have inserted in a note the character of this genus so defined by my accurate and indefatigable friend the Rev. William Kirby, F.L.S., who, at my request, undertook that task. I shall only add one more observation, which is, that, numerous as this genus is in New Holland, I have never seen a single specimen from any other country, in the many cabinets that I have examined.

NOTOCLEA.

Character Generis.

Antennæ filiformes.
Caput immune, deflexum.
Thorax transversus, dilatato-marginatus.
Elytra dilatato-marginata, angulo baseos exteriori acuto.
Corpus ovale, valde convexum, subtus planum*.

Species.

* Corpus ex oblongo hemisphæricum, subtus planiusculum.

Caput insertum, parvum, transversum.

Oculi laterales, subreniformes, reticulati.
Nasus distinctus, postice obtusangulus, antice transversus.
Labium (seu *labium superius*) parvum, transversum, apice subemarginatum.
Labrum (seu *labium inferius*) apice emarginatum, ex apice palpigerum.
Valvulæ breves, apice piloso palpiformi, e latere palpigeræ.
Palpi exteriores (seu *valvulares*) 4-articulati; articulo primo et baseos minutissimo; secundo longiori clavato incurvo subcompresso; tertio brevi clavato; ultimo magno compresso, securiformi, apice intus concavo.
Palpi interiores (seu *labiales*) triarticulati; articulis clavatis equalibus.
Mentum transversum, parallelogramicum, interdum apice emarginatum.

Maxillæ

SPECIES.

1. NOTOCLEA VARIOLOSA.

Not. picea, elytris punctis confluentibus flavis irroratis.

TAB. XXIV. Fig. 1.

Longitudo Corporis 7 lin. Latitudo 5 lin.

Habitat in Novâ Hollandiâ.

Corpus piceum, seu rufo-piceum, nitidum. *Caput* punctulatum, lineâ longitudinali postice excavatum. *Thorax* irregulariter punctatus; lateribus depressiusculis punctis magis excavatis confluentibus irroratis. Anguli antici thoracis sub-mucronati sunt. *Elytra* punctatissima, punctis confluentibus, punctis insuper difformibus elevatiusculis flavis irrorata.

2. NOTOCLEA RETICULATA.

Not. flavescens, elytris sanguineis punctis elevatis flavis reticulatis.

TAB. XXIV. Fig. 2.

Long. Corp. 4½ lin. Lat. 3½ lin.

Habitat in Novâ Hollandiâ.

Corpus sordidè flavum, nitidum. *Caput* punctulatum, luteo nebulosum. *Antennæ* apicem versus paulo crassiores. *Thorax* sparsim punctatus, utrinque impressus, luteo nebulosus, angulis anticis acutis. *Elytra* sanguinea, punctis creberrimis

Maxillæ breves, validissimæ, incurvæ, apice bidentatæ intus concavæ.

Antennæ antice inter oculos et nasum in angulo frontis insertæ, subfiliformes, 11-articulatæ; articulo primo magno, tereti, subclavato, arcuato; secundo brevi, subconico; proximis duobus (interdum tribus) elongationibus subclavatis; reliquis ex conico oblongiusculis, compressis, subæqualibus, extimo acutiusculo.

elevatis

elevatis flavis confluentibus reticulata, et inter hæc puncta alia insuper innumera excavata conspicienda quæ etiam confluunt; latera elytrorum item flava. Alæ sanguineæ.

3. Notoclea atomaria.

Not. flava antice pallido-testacea, antennis rufescentibus, thorace elytrisque punctatissimis: punctis impressis.

Tab. XXIV. Fig. 3.

Long. Corp. 4¼ lin. Lat. 3¼ lin.

Habitat in Novâ Hollandiâ. In Mus. *Dom. Milne.*

Antennæ præcipue extus rufescentes. *Os* et *Oculi* nigri. *Corpus* supra antice, capite scilicet, thorace et elytrorum basi, pallide testaceum, postice luteo-rufescens. *Caput* puncto ad basin fusco-rufescenti. *Thorax* medio pallescens punctulis obsoletis, ad margines punctis majusculis impressis fundo rufescentibus. *Elytra* ad basin pallidiuscula, postice luteo-rufescentia, punctis per totam paginam profunde impressis, fundo rufescentibus. *Corpus* subtus flavum, sive flavo-rufescens, abdominis segmentis basi nigro-fuscis. *Pedes* concolores.

4. Notoclea lutea.

Not. lutea obscura, scutello tuberculisque aliquot elevatis flavis.

Tab. XXIV. Fig. 4.

Long. Corp. 7 lin. Lat. 5 lin.

Habitat in Novâ Hollandiâ.

Corpus supra totum luteum, obscurum. *Thorax* utrinque depressiusculus, punctulatus. *Oculi, Os* et *Abdomen* nigra. *Elytra* punctata, punctis numerosissimis impressis; per discum verrucæ aliquot, sive puncta elevata longitudinaliter posita,

sita

sita sunt. Hæc ut et scutellum nitidiuscula, punctulis immunia, et amœne flava. *Abdomen* subtus nitidum, atrum. *Pedes* lutei.

Cum ex unico specimine hanc descriptionem tuli numerum tuberculorum sive punctorum elevatorum non ausus sum dicere. Tria majora in utroque elytro, longitudinaliter posita, præcipue visa sunt. Hinc inde unum aut alterum minus oculis objicitur.

5. NOTOCLEA MACULATA.

Not. thorace utrinque emarginato, elytris fuscescentibus: lateribus maculisque luteis.

TAB. XXIV. Fig. 5.

Long. Corp. 4. lin. Lat 3¼ lin.

Habitat in Novâ Hollandiâ.

Corpus rufo-piceum, nitidum. *Caput* sordide flavescens, luteo maculatum, punctulatum. *Antennæ* corpore dimidio breviores, filiformes, nigræ, basi flavæ. *Thorax* sordide flavus, luteo-maculosus, leviter punctulatus, lateribus depressiusculis, excavato-punctatis, puncto insuper majori impressis. Margo thoracis lateralis submarginatus, angulis anticis rotundatis. *Coleoptera* fusca, excavato-punctata, luteo maculata et punctata, maculis 4 majoribus dorsalibus quadratim positis. Latera elytrorum item flavescunt. Macula flava in elytris lævia sunt.

Var. β flavescens, elytris rufo-fuscis flavo maculatis, alia et simillima.

6. NOTOCLEA QUADRIMACULATA.

Not. pallida, elytris scabro-punctatis: maculis duabus fuscis.

TAB.

TAB. XXIV. Fig. 6.

Long. Corp. 5 lin. Lat. 3½ lin.

Habitat in Novâ Hollandiâ. In Mus. *Dom. MacLeay.*

Caput pallidum, lineâ medio nigrâ. *Antennæ* pallidæ, apice fuscescentes. *Thorax* flavescens, maculis duabus punctisque impressis ad latera nigris. *Elytra* pallida, sive pallido-testacea, scabro-punctata, punctis impressis fuscis, antice vage et postice substriatim positis. In utroque elytro maculæ duæ fuscæ, quarum una antice pallidior subrotunda, et altera postice subtrigona. *Corpus* subtus pallidum. *Pedes* testacei.

7. NOTOCLEA ORNATA.

Not. rufa nitidiuscula, elytris punctatissimis flavo striatim variis.

TAB. XXIV. Fig. 7.

Long. Corp. 3½ lin. Lat. 2½ lin.

Habitat in Novâ Hollandiâ.

Antennæ dimidio nigræ, dimidio ad basin rufescentes. *Scutellum* saturatè rufum. *Thorax* ad latera præcipuè punctatus. *Elytra* rufa, punctatissima punctis impressis, maculis minutis flavis per totam paginam conspersa. Hæ autem maculæ omnes quasi per strias positæ sunt, tum formâ regulari rotundiusculâ, præterquam ad margines ubi difformes subinde evadunt, notabiles; unde ab *Not. variolosâ* abunde differt. Totum *Corpus* subtus unicolor rufescens. *Variat* flavus, rufus.

8. NOTOCLEA OBSOLETA.

Not. rufa, antennis oculis maculisque elytrorum decem obsoletis nigris.

TAB. XXIV. Fig. 8.

Long. Corp. 3½ lin. Lat. 2½ lin.

Habitat

Habitat in Novâ Hollandiâ.

Corpus totum rufum. *Thorax* punctulatissimus, punctis vix sub lente (præterquam ad margines ubi majores sunt) conspiciendis. *Elytra* punctatissima, punctis satis magnis impressis. In utroque elytro puncta decem nigra obsoleta, in tribus fasciis disposita. Quatuor puncta fasciam primam conficiunt, tres utramque exteriorem. *Abdomen* subtus et *pedes* paulo pallidiores.

9. Notoclea minor.

Not. rufa, antennis testaceis, oculis fasciisque tribus elytrorum nigris, elytris striatis.

Tab. XXIV. Fig. 9.

Long. Corp. 2 lin. Lat. $1\frac{1}{4}$ lin.

Habitat in Novâ Hollandiâ.

Affinis maximè præcedenti, at satis differt, antennis testaceis, nec nigris; elytris striatis, neque irregulariter confertissimè punctatis; fasciisque tribus nigris, fasciis continuis, neque interruptis sive punctis fasciæformibus dispositis. *Abdomen* subtus et *pedes* pallidiores.

10. Notoclea testacea.

Not. testacea tota, oculis antennisque nigris.

Tab. XXIV. Fig. 10.

Long. Corp. 3 lin. Lat. 2 lin.

Habitat in Novâ Hollandiâ.

Corpus totum testaceum, præterquam oculi atque antennarum articuli omnes extimi, qui omnes nigri. *Elytra* leviter striata, striis punctatis. Margines thoracis elytrorumque punctati,

tati, punctis impressis. Est ubi certo lucis respectu, elytra nigro obsolete pulverulenta videntur. *Abdomen* et *pedes* omninò testacei.

11. Notoclea stictica.

Not. nitidiuscula, thorace rufescenti, scutello atro, elytris subtestaceis nigro punctatissimis.

Tab. XXV. Fig. 1.

Long. Corp. 3 lin. Lat. 2 lin.

Habitat in Novâ Hollandiâ.

Caput rufescens, punctulis ad occiput duobus nigris. *Oculi* nigri. *Thorax* rufescens. *Scutellum* atrum, nitidum. *Elytra* thorace pallidiora sive testacea, punctis numerosissimis impressiusculis concinnè rotundatis conspersa. *Corpus* subtus testaceum, nitidum. *Pedes* testacei, geniculis plantisque nigris. Thorax et elytra ad margines punctata, punctis impressis. In utroque elytro tuberculum sive punctum humerale majus elevatum commatiforme, obscurum.

12. Notoclea verrucosa.

Not. obscura rufa punctatissima, elytris tuberculatis: tuberculis numerosis nigris.

Tab. XXV. Fig. 2.

Long. Corp. $3\frac{1}{4}$ lin. Lat. $2\frac{1}{4}$ lin.

Habitat in Novâ Hollandiâ.

Corpus suprà, præter oculos et tubercula elytrorum quæ atra sunt, rufum. *Caput* et *thorax* immaculata, punctulatissima. *Scutellum* immaculatum, rufum. *Elytra* omninò punctata, punctis impressis, porrò per totam paginam tuberculis parvis

vis conspersa sunt, quorum unum in utroque elytro humerale majus, commatiforme. *Abdomen* nigro-rufescens. *Pedes* rufescentes, femoribus nigris.

13. Notoclea brunnea.

Not. nigro-rufa nitidiuscula, oculis nigris, elytris obsoletissimè striatis.

Tab. XXV. Fig. 3.

Long. Corp. 5 lin. Lat. 3¼ lin.

Habitat in Novâ Hollandiâ.

Corpus totum satis nitidum, castaneum, sive nigro-rufum. *Oculi* nigri. *Antennæ* castaneæ. *Thorax* utrinque scrobiculatus. *Elytra* striata, striis valde obsoletis. Margo suturalis tenuiformis nigricans. *Pectus* nitidum, nigrum. *Abdomen* et *pedes* brunnei.

14. Notoclea immaculata.

Not. fusca, capite thorace elytrorumque suturâ rubentibus.

Tab. XXV. Fig. 4.

Long. Corp. 5¼ lin. Lat. 4¼ lin.

Habitat in Novâ Hollandiâ.

Corpus fuscum, seu potiùs nigro-fuscum, nitidum. *Caput* fusco-rubrum, punctatum. *Antennæ* thorace longiores, basi tenuiores, flavescentes, apice fuscæ. *Thorax* fusco-ruber, punctatus: disco lævi, angulis anticis rotundatis. *Elytra* sparsim punctata: punctis excavatis, disco lævia apud suturam fusco-rubra. *Pedes* anteriores rubent. *Tarsi* articulo primo subtus longitudinaliter canaliculato.

15. No-

*15. NOTOCLEA LITURATA.

Not. thorace utrinque impresso, elytris rufo-castaneis: liturâ nigrâ.

TAB. XXV. Fig. 5.

Long. Corp. 4 lin. Lat. 3 lin.

Habitat in Novâ Hollandiâ.

Caput rufo-castaneum, puncto in occipite impresso. *Antennæ* corpore dimidio breviores, basi castaneæ, apice fuscæ. *Thorax* rufo-castaneus, marginatus, utrinque scrobiculatus. *Elytra* rufo-castanea, liturâ longitudinali nigrâ, antice intus angulatim inflexâ, postice attenuatâ at apicem haud attingente. *Abdomen* antice nigrum, postice castaneum. *Pedes* castanei.

Macula elytrorum haud male Hebræam *Vau* refert.

Variat castanea, rufo-castanea, rufa.

16. NOTOCLEA PUNCTATA.

Not. nigro-rufa, oculis nigris, capite thorace elytrisque punctatissimis.

TAB. XXV. Fig. 6.

Long. Corp. 4 lin. Lat. 2½ lin.

Habitat in Novâ Hollandiâ.

Antennæ nigro-rufæ, articulo ultimo paulò saturatiori. *Oculi* nigri. *Caput*, *thorax*, et *elytra* omnia punctatissima, punctis magnis impressis. Margo elytrorum exterior rufescens. *Abdomen* subtus nigrum, nitidum, apice brunneum. *Pedes* rufescentes.

17. NOTOCLEA CASTANEA.

Not. castanea, elytris punctis impressis striisque aliquot elevatis interruptis scabris.

TAB.

TAB. XXV. Fig. 7.

Long. Corp. 4½ lin. Lat. 3½ lin.

Habitat in Novâ Hollandiâ. In Mus. *D. Mac Leay.*

Caput castaneum, ore pallidiore. *Antennæ* rufescentes. *Thorax* castaneus, punctatus, lateribus pallidioribus et scabris. *Elytra* castanea, punctata, scabra, punctis plurimis impressis et striis 7—8 elevatis interruptis, quasi ex punctis elevatis constantibus. *Corpus* subtus castaneum. *Pedes* paulo pallidiores, sive rufescentes.

18. NOTOCLEA SEXPUSTULATA.

Not. thorace utrinque impresso, coleoptris nigris: maculis sex rubris.

TAB. XXV. Fig. 8.

Long. Corp. 6 lin. Lat. 5 lin.

Habitat in Novâ Hollandiâ.

Caput nigrum, ore rubro. *Antennæ* piceæ corpore dimidio breviores. *Thorax* niger, marginatus, utrinque scrobiculatus, lateribus rufis. *Elytra* nigra, punctulata, punctato-striata, maculis tribus rubris, quarum una thoraci proxima major est, duæ prope apicem transversim positæ. *Corpus* subtus atrum, nitidum. *Pedes* nigri.

19. NOTOCLEA LINEATA.

Not. atra, elytris punctato-striatis: lineis duabus maculisque duabus baseos rubris.

TAB. XXV. Fig. 9.

Long. Corp. 5 lin. Lat. 3½ lin.

Habitat in Novâ Hollandiâ. In Mus. *Dom. Mac Leay.*

Caput

Caput atrum, ore piceo. *Antennæ* nigræ, basi rubræ. *Thorax* ater, punctatus, nitidus. *Elytra* atra, nitida, punctato-striata, lineâ rubrâ prope marginem et aliâ abbreviatâ ad suturam postice positâ. Ad basin maculæ duæ rubræ, quarum una longa lineolæ instar prope scutellum est, et altera minor subtrigona juxta lineam exteriorem. *Corpus* subtus atrum, nitidum. *Pedes* nigri, femoribus piceis.

20. Notoclea octomaculata.

Not. rubra, coleoptris maculis octo difformibus atris.

Tab. XXV. Fig. 10.

Long. Corp. 4 lin. Lat. 3 lin.

Habitat in Novâ Hollandiâ. In Mus. *Dom. Milne.*

Antennæ atque *oculi* atri. *Caput* rubrum. *Thorax* ruber, maculis tribus atris, quarum media triloba est, et duæ laterales reniformes. *Scutellum* atrum. *Elytra* rubra, sub lente obsoletiùs punctato-striata. In utroque maculæ quatuor atræ, quarum duæ minores sub-reniformes ad basin, altera ad medium arcuata, et quarta ad apicem linearis longitudinaliter posita. *Corpus* subtus nitidum. *Sternum* rubrum. *Abdomen* atrum, marginibus rubris. *Pedes* atri.

Since the preceding Monograph was read to the Linnean Society, I have received M. Latreille's *Genera Crustaceorum et Insectorum,* printed at Paris in 1807; and I find that the genus Notoclea was known to that celebrated entomologist. It forms the first family of his 328th genus, *Chrysomela,* under the name of *Coccinelloides,* to which he gives the following character: "*Corpus sub-hemisphæricum ; palpi maxillares articulo ultimo obtrigono.*"

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For an example of this family he refers to *Chrysomela Australasiæ* of Fabricius, an insect not known to me, but evidently belonging to my genus of Notoclea.

It is proper to add that the same author appears to allude to insects of this genus in a note upon the genus Chrysomela in page 160 of the *Tableaux Méthodiques*, contained in the 24th volume of the *Nouveau Dictionnaire d'Histoire Naturelle*, published at Paris in 1804, where he observes, "Les Indes orientales fournissent "plusieurs espèces de *Chrysomèles* dont le corps est *hémisphérique*, "et les palpes maxillaires presque terminés en hache."

XXII. *Some*

XXII. *Some Remarks on the Plants now referred to Sophora, with Characters of the Genus Edwardsia. By R. A. Salisbury, F.R.S. and L.S.*

Read December 16, 1806.

There is no genus in the vast natural order of *Leguminosæ*, which appears to me so great a disgrace to modern botanists, as *Sophora*. *Mimosa* indeed, I presume, must also be divided; but the species referred to it have all a strict affinity to each other, whereas *Sophora*, as it stands in the last edition of the *Systema Vegetabilium*, contains at least eight genera, very few if any of which will follow each other, in a natural series. Lamarck has detached two of these heterogeneous parcels, joining with them nevertheless some that are quite dissimilar in habit. Professor Willdenow on the contrary, strange to tell, has not only re-united these two genera of Lamarck's, but added to them a third still more discordant, and nearer allied to *Halodendrum*.

It is well known that our great master Linnè only regarded *Sophora* as a reservoir, into which he put every leguminous plant with distinct stamina, that he could not refer to any other established genus. Those which I think ought to be separated, are, 1st, *S. Monosperma* of Swartz: a tree with large pinnated leaves, somewhat like those of *Juglans*, no stipules, terminal panicles of flowers, and a broad hairy pod, containing one or two scarlet and black seeds as big as a small hazel-nut: 2dly, *S. Havanensis*, *Tomentosa*, *Occidentalis*, *Japonica* and *Heptaphylla*: these trees have

have pinnated leaves without stipules, terminal spikes of flowers, deciduous filaments; and the three first are probably all one and the same plant: 3dly, *S. Alopecuroides*, to which genus also belongs the *S. Flavescens* of Solander, first taken up from his MS. in *Hortus Kewensis:* these two oriental plants are herbaceous, have pinnated leaves without stipules, terminal spikes of flowers, and persistent filaments: 4thly, *S. Tetraptera* and *Microphylla*, of which genus a third species has been discovered in the Sandwich Isles: they have pinnated leaves without stipules, short axillary spikes of flowers, and deciduous filaments inserted in a large goblet-shaped 10-angular receptacle, which internally is callous; as soon as the petals and filaments fall off, the honey gushes out abundantly from their scars, a circumstance so singular that I believe no other instance has yet been observed: May we infer from it that this sweet secretion is destined to be absorbed by the young fruit? Does the honey in a hotter climate than ours, where these trees are indigenous, exude gradually from all the interior surface of the receptacle? for in *Iris Xiphium* I have seen it sweating out in hot sunshine, so as to form large drops even upon the external surface of the tube: 5thly, *S. Capensis:* this shrub is furnished with stipules, pinnated leaves, long axillary spikes of fragrant flowers, and a comprest pod: the *S. Aurea* of Solander, which Lamarck joins to it, is a very different tree, much nearer related to *Robinia*, where it has been placed by that excellent botanist L'Heritier: 6thly, *S. Genistoides:* to this shrub the *S. Ternata* and *Trifoliata* of Thunberg are probably allied: they have ternate leaves with stipules, axillary flowers, and differ essentially from the other Cape plants arranged under *Sophora*, in the structure of their calyx: 7thly, *S. Tinctoria, Australis, Lupinoides*, and *Alba:* these are herbaceous plants from North America, with ternate leaves,

 large

large stipules, terminal spikes of flowers, and a very inflated pedicellated pod; most of them afford indigo, and look like species of *Crotolaria*, under which genus Linnè has inserted *S. Alba* in *Species Plantarum:* 8thly, *S. Buxifolia, Rotundifolia, Hirsuta, Calyptrata*, and *Biflora:* Professor Retzius first distinguished these shrubs, which all grow at the Cape of Good Hope, and I cannot see the smallest affinity in them to the preceding North American plants; they have exceedingly small stipules prest close to the stem, thick downy simple leaves, axillary flowers either solitary or in short spikes, and a calyx redoubled at the base, with a large sessile pod.

I have given the characters of the last of the above genera in *Paradisus Londinensis*, retaining for it, by possibly a more canonical derivation, Lamarck's name of *Podalyria.* I propose now briefly to describe the fourth, calling it after that celebrated botanic painter, who has for many years executed the figures in the *Botanical Magazine.*

EDWARDSIA.

Leguminosæ. *Juss. Gen. p.* 345.

Sect. IV. Corolla papilionacea. Filamenta 10, libera. Pericarpium 1-loculare, 2-valve. *Folia impari-pinnata. Stipulæ nullæ.*

Torus calathiformis, 10-angulus, post lapsum petalorum filamentorumque ex eorum cicatricibus mellifluus. Calyx obliquus, 5-dentatus latere superiore fisso. Petala conniventia, rectiuscula, Carinâ longâ 2-petala. Pericarpium moniliforme, 4-pterum, polyspermum. *Arbores humiles. Folia serâ hyeme decidua, juniora sericea. Flores aurei; in spicis brevibus,*

axillaribus,

axillaribus, futuri anni jam æstate prodeuntibus. Bracteæ minutæ, persistentes. Genus ab affinibus toro et inflorescentiâ prorsus abludens: pericarpium consimile apud Buxb. Cent. 3. t. 47. *indicavit acutissimus* Dryander, *sed in istâ stirpe, folia videntur esse stipulata. Nomen dedi in honorem* Sydenhami Edwards, *egregii Botanici Pictoris.*

1. Edwardsia microphylla.

E. foliolis 1—2½ lineas longis, suborbicularibus: carinæ petalis ellipticis, margine dorsali uncinato.

Sophora microphylla. *Jacq. Hort. Schonbr. v.* 3. *p.* 17. *t.* 269. Sophora microphylla. *Lam. Illustr. t.* 325. *f.* 1. Sophora Microphylla. *Sol. in Ait. Hort. Kew. v.* 2. *p.* 43.

Sophora tetraptera. *Forst. Prodr. p.* 32. Sophora tetraptera. *Linn. Fil. in Suppl. p.* 230.

Sponte nascentem in Ins. *New Zealand*, legit J. Banks, baronettus. Floret adhuc rarius apud nos.

2. Edwardsia chrysophylla.

E. foliolis 8—10 lineas longis, obovatis; carinæ petalis ellipticis, margine dorsali recto.

Tab. XXVI. Fig. 1.

Sponte nascentem in Insulis *Sandwich*, legit A. Menzies.

Facies aliqua sequentis, sed pubescentia dum tenera magis aurea. Folia densa: Petiolus angustus: Foliola 15—19, obovata, plus minus retusa. Flores minores quam in cæteris. Calyx tantummodo 3 lineas longus. Petala in specimine *Herbarii Banksiani*, ad quod descripsi, pallide flava.

3. Edwardsia grandiflora.

E. foliolis 10—15 lineas longis, lanceolatis: carinæ petalis late falcatis.

Sophora tetraptera. *Curt. in Bot. Mag. n.* 167. *cum Ic.* Sophora tetraptera. *Lamarck Illustr. t.* 325. *f.* 3. Sophora tetraptera. *J. Mill. Ic. t.* 1. pulchrâ sed insertione genitalium non fideliter depictâ. Sophora tetraptera. *Soland. in Ait. Hort. Kew. v.* 2. *p.* 43.

Sponte nascentem in Ins. *New Zealand*, legit J. Banks, baronettus.

Floret *Septembri, Octobri;* apud nos autem *Maio.*

Flores in hac specie pulcherrimi, grandes. Pericarpium omnium consimile et tetrapterum.

XXIII. *Cha-*

XXIII. *Characters of Platylobium, Bossiæa, and of a new Genus named Poiretia. By James Edward Smith, M.D. F.R.S. P.L.S.*

Read May 3, 1808.

HAVING lately had my attention recalled to the Papilionaceous plants of New Holland with 10 separate stamens, the result of which I have had the honour of laying before the Linnean Society, I have been induced to reconsider some of the same great natural order, from that country, with united or diadelphous filaments, particularly my own genus *Platylobium*, and one which has been improperly confounded with it, the *Bossiæa* of M. Ventenat. I have been the more immediately urged to take up the subject, because this very eminent French botanist, misled by the accounts of others, has supposed these genera to be one and the same, and has, in a letter to me, apologized, with his usual candour, for establishing a new genus apparently in competition with my *Platylobium*, for want, as he is pleased to say, of his having sufficient information on the subject. I was happy to take the first opportunity which the state of public affairs would allow me, of removing his doubts, and, as far as my judgment would go, of confirming the genus he had founded. The following essential characters will, I trust, keep the 2 genera in question, as well as a new one that I have to propose, perfectly distinct, and I shall subjoin definitions of every species of each with which I am acquainted. They are all brought from the neighbourhood of Port Jackson, New South Wales,

and

and have flowered in the gardens about London, except *Poiretia elliptica,* which comes from the other side of New Holland.

The genera in question belong to the 1st section of *Diadelphia Decandria* in Linnæus, "*staminibus omnibus connexis,*" and to the 5th section of Jussieu's *Leguminosæ.*

1. Platylobium. *Trans. of Linn. Soc. v.* 2. 350.

Calyx bilabiatus; labio superiore bifido, rotundato. *Legumen* pedicellatum, compresso-planum, membranaceum, dorso alatum, uniloculare, polyspermum.

1. P. *formosum,* foliis cordato-ovatis, germine piloso.
P. formosum. *Bot. of N. Holl.* 17. *t.* 6. *Curt. Mag. t.* 469. *Ventenat Malmais. t.* 31.

This shrub has been so fully described, especially in the 2d volume of our Transactions, that I have nothing new to add, except an improvement of the character of the calyx, which is truly 2-lipped.

2. P. *parviflorum,* foliis lanceolato-ovatis, germine glabro. *Bot. of N. Holl.* 18.

This species flowered at Messrs. Grimwood's, Kensington, in 1799, and in several other gardens since, but I know not that it has been figured.

2. Bossiæa. *Ventenat Jard. de Cels,* 7.

Calyx bilabiatus; labio superiore bifido, retuso. *Legumen* pedicellatum, compressum, margine utroque incrassatum, intùs spongiosum, multiloculare, polyspermum.

1. B. *heterophylla,* ramis compressis, foliis ellipticis linearibusque.

B. hetero-

B. heterophylla. *Vent. Jard. de Cels, t. 7. Willd. Sp. Pl. v. 3. 972. Dryand. in Ann. of Bot. v. 2. 526.*

Platylobium lanceolatum. *Andr. Repos. t. 205.*

The almost woody texture of the legume; its two incrassated margins, without the dilatation of the upper edge characteristic of *Platylobium;* and its being separated by its spongy internal structure into as many cells as there are seeds, are surely sufficient characters for this genus, which is moreover very distinct in habit from *Platylobium.* The present species has often been fully described; the following are less known.

2. B. *scolopendria,* ramis compressis alatis dentatis denudatis, foliis ovato-ellipticis.

Platylobium scolopendrum. *Andr. Repos. t. 191.*

P. scolopendrium. *Vent. Malmais. t. 55.*

Very remarkable for its winged branches, justly compared by Ventenat to those of *Cactus Phyllanthus,* though of smaller dimensions. The leaves are few, and soon fall off; their form is rather more ovate than elliptical.

3. B. *ovata,* ramis teretibus, foliis elliptico-ovatis.

B. ovata. *Dryand. in Ann. of Bot. v. 2. 526.*

Platylobium ovatum. *Andr. Repos. t. 266.*

This has most resemblance to the first species in being, like that, very leafy, but the leaves are much more uniform, and the branches are all round. The edges of the leaves in my wild specimen are thickened, wavy, and somewhat crenate.

4. B. *microphylla,* ramis teretibus spinescentibus, foliis obcordato-cuneiformibus.

Platylobium microphyllum. *Sims in Curt. Mag. t. 863.*

Easily

Easily distinguished by its little, roundish, wedge-shaped, more or less obcordate, leaves, and the spinous terminations of its branches. The flowers in all the 4 species are orange beautifully variegated with crimson; the keel in this last is purple.

3. Poiretia.

Calyx bilabiatus; labio superiore bifido, retuso. *Legumen* sessile, sphæricum, inflatum, uniloculare, dispermum.

1. P. *linearis*, foliis linearibus revolutis.

This shrub, seeds and specimens of which have been sent from New South Wales, flowered in Mr. George Hibbert's rich collection at Clapham in 1798; but I am not aware that any figure or description of it has been published. It constitutes a very distinct new genus, allied to *Platylobium* and *Bossiæa*, but sufficiently different in habit, and essentially distinguished from them, as they are from each other, by the fruit. I wish to dedicate this genus to M. Poiret, the able continuator of the botanical part of the French *Encyclopedie* since it was given up by M. Lamarck. I have the more pleasure in doing this justice to M. Poiret's merits, because the plant which the late Abbé Cavanilles named *Poiretia* in 1797, had, unknown to either of these gentlemen, been published by me in the Stockholm Transactions, three years before, as *Sprengelia*, and I was therefore the innocent cause of a disappointment to both.

This species of *Poiretia*, on which I have founded the genus, is a rather slender shrub, with alternate, round, leafy branches, clothed in their younger and upper parts with short dense silky hairs. Leaves alternate, on short, thick, hairy footstalks; spreading, 2 or 3 inches long, linear, narrow, obtuse with a small point, somewhat revolute, obsoletely crenate; smooth above; paler, often

often hairy and rusty-coloured, with a prominent rib, beneath; reticulated on both sides with innumerable minute veins. Stipulas small, linear-lanceolate, recurved, rigid, smooth. Flowers rather small, on short, simple, axillary, hairy stalks, either solitary or in pairs, with 2 or more small lanceolate bracteas. Calyx densely clothed externally with brown and white silky hairs, in the manner of some *Astragali*, 2-lipped, permanent; the upper lip largest, spreading upwards, extremely abrupt, cloven; lower of 3 equal lanceolate segments. Corolla longer than the calyx, variegated with lilac and violet. Stamens 10, all united into a tube cloven to the very base at its upper side, and permanent under the ripe fruit. Germen roundish, smooth. Style awl-shaped, ascending, hairy at the base only. Stigma obtuse. Legume sessile, naked, minutely furrowed and striated, of a shining brown, cartilaginous, globose, or very slightly compressed, about ¼ of an inch in diameter, tipped with a minute oblique point, inflated, of one cell. Seeds 2, roundish, smooth, variegated, 1 affixed to each valve at the upper suture, and accompanied, as in the two preceding genera, by a white oblong appendage or *strophiolum*.

2. P. *elliptica*, foliis elliptico-oblongis.

This is known to me merely by a specimen gathered by Mr. Menzies at King George's Sound, on the west coast of New Holland, which unluckily is not in fruit, but the whole habit, and all the parts of the flower, so precisely agree with the foregoing species, that I have no doubt of the genus of the present plant. The branches are round, alternate, leafy, silky when young. Leaves about an inch and half long, alternate, on short downy stalks; more or less accurately elliptical, flat, entire, or very obscurely crenate, emarginate with a diminutive point;

 smooth

smooth and shining above; opaque and minutely hairy beneath, with a strong mid-rib; reticulated on both sides with numerous veins. Stipulas very small, lanceolate, erect. Flower-stalks about the upper parts of the branches, half an inch or more in length, axillary, generally in pairs from one common, short, bracteated base, and each bearing one purplish flower, with a pair of very small bracteas at the base of its calyx. The flower-stalks, bracteas and calyx are clothed with silky rusty hairs; the upper lip of the latter is very broad, the segments of the lower lip short. Stamens as in the former species. Germen roundish, smooth. Stigma obtuse.

Norwich, March 30, 1808.

XXIV. *Musci Nepalenses; or Descriptions of several new Mosses from Nepal.* By *William Jackson Hooker, Esq. F.L.S.*

Read June 7, 1808.

It is through the kindness of Dr. Smith, who has favoured me with specimens for the purpose, that I have now the honour of laying before the Linnean Society figures and descriptions of such of the mosses gathered by Dr. Francis Buchanan, during his journey to Nepal, as appear to have escaped the attention of former writers on this subject. His collection contained also a few others already published, the names of which I have thought it best to insert, as nothing whatever is at present known respecting the *Muscologia* of that very extensive country.

1. Sphagnum *iridans.*

S. iridans. Bridel. *Suppl.* I. *p.* 20.
S. javense. Bridel. *Hist. Musc.* II. *p.* 27. *t.* 6. *f.* 3.
S. clandestinum. Palisot de Beauvois. *Prod. Æth. p.* 88.

The only specimen that Dr. Smith has received of this is barren. It is most probably a *Dicranum,* as Bridel suspects, and there is a plant with fructification in Mr. Turner's collection,

 gathered

gathered by Mr. Menzies in New Zealand, so like it, as to be perhaps not distinct.

2. Octoblepharum *albidum.* Hedw.

3. Splachnum *squarrosum.*

Splachnum foliis lineari-lanceolatis acuminatis serratis: apice horizontalitèr patulis, capsulâ cylindraceâ, apophysi obconicâ.

Caules cæspitosi, pollicares, vel sesquipollicares, erecti, nunc simplices, nunc basin versùs bifurci; infernè, sicut in Muscis aliis loca turfosa colentibus, tomento nigro-ferrugineo densè obtecti, supernè foliosi. *Folia* lutescenti-viridia, undique laxè disposita, basi imbricata, apice horizontalia, vel etiam recurva, lineari-lanceolata, acuminata, reticulata, margine supra medium argutè et manifestè serrata, nervo crasso, obscuro, in acumen longum, extra paginæ apicem producto, instructa; madore plana, siccitate crispatula. *Pedicellus* terminalis, ferè unguicularis, erectus, strictus, croceus, glaber. *Capsula* luteo-fusca, cylindracea, perbrevis, orâ incrassatâ, in exsiccatis ampliatâ, apophysi insidens obconicæ, capsulâ paullùm longiori, vix tamen latiori, eique concolori, adeò ut una ægrè ab alterâ dignoscatur. *Peristomium* dentibus sedecim, magnis, luteis, incurvis, transversè striatis, per paria approximatis. *Columella* capsulâ brevior. —Neque calyptram nec operculum hactenùs vidi.

Every other species of *Splachnum* at present described having its leaves either pressed close to the stem, or at least between erect and patent, there can be no difficulty in distinguishing the present, in which they are, both when moist and dry, disposed in a horizontal direction. In addition to this most obvious

obvious distinction, they are more deeply serrated than those of all the other species, without excepting even *S. serratum*, and the reticulations are less apparent than is common in most of the individuals of this beautiful genus. The apophysis is so obsolete as scarcely to be distinguishable from the capsule, which in its form bears a great resemblance to that of *S. tenue*. Dr. Buchanan found this plant at Naram Hetty.

Tab. XXVI. Fig. 2.

a. *Splachnum squarrosum*, natural size.
b. *leaf*, magnified.
c. *capsule*, magnified.

4. Pterogonium *declinatum*.

Pterogonium caule repente, foliis imbricatis ovatis integerrimis mediotenùs uninervibus, capsulâ declinatâ, operculo incurvato.

Caules procumbentes, reptantes, ramosissimi, ramis vagis, numerosis, unguicularibus, adscendentibus, divisis, curvatis, teretibus, apicem versùs levitèr incrassatis, basi denudatis, indè foliosis. *Folia* pallidè viridia, laxiusculè imbricata, erecto-patula, ovata, brevitèr acuminata, plana, margine integerrima, nervo obscuro concolore ultra medium evanescente instructa; *perichætialia* reliquorum similia, sed aliquantùm angustiora, magis acuminata et lutescentia, basi rufescente. *Pedicellus* lateralis, ramorum prope medium ortus, unguicularis, erectus, rufo-fuscus, infernè lævis, supernè punctis elevatis scabrosus. *Capsula* oblonga, infra oram aliquantùm angustata, declinata, rufo-ferruginea, punctata, orâ incrassatâ. *Operculum* capsulæ concolor, ejusque

instar

instar punctatum, conicum, curvulum. *Calyptra* tenuis, dilutè fusca, subulata, curvata, dimidiata, lævis. *Peristomium* dentibus sedecim, suberectis, e capsulæ membranâ interiore reticulatâ ortis, lineari-subulatis, luteis, transversè striatis, a basi ad medium longitudinalitèr fissis.

I have named this plant from its most obvious character, the drooping capsule, in which it differs from all the other species of this genus described by Hedwig or Bridel, and has, in consequence of it, so completely the appearance of a *Hypnum*, that no one would suspect its real family, without first examining it. There will also be found under the microscope a strong peculiarity in the circumstance of the teeth of the peristomium being cleft in a very curious manner.

Tab. XXVI. Fig. 3.

a. *Pterogonium declinatum*, natural size.
b. *part of a branch*, magnified.
c. *leaf.*
d. *perichætial leaf.*
e. *capsule.*
f. *operculum.*
g. *calyptra, with the operculum.*
h. *teeth of the peristomium.*

5. Pterogonium *ambiguum.*

Pterogonium caule pendulo pinnato, foliis obovatis concavis uninervibus, capsulâ terminali globosâ sessili, operculo planiusculo.

Caules semipedales et ultrà, denudati, tenues, subflexuosi, debiles,

biles, penduli, pinnatìm ramosi; rami ut plurimùm alterni, vel rariùs secundi, hìc illìc intervallis bi- tri-linearibus se-tuncti, horizontales, circitèr pollicares, aliis minoribus simili modo pinnati, foliosi. *Folia* laxè imbricata, erecto-paten-ia, obovata, brevitèr apiculata, valde concava, margine propè apicem involuto, cætera plano, ubique integerrimo, nervo obscuro ante apicem evanescente instructa; *perichæ-tialia* erecta, ovato-lanceolata, acutiuscula, paullùm modò concava, margine supernè revoluta, nervo ad apicem usque attingente percursa; omnia siccitate longitudinalitèr striata. *Capsulæ* propemodùm sessiles, foliis perichætialibus im-mersæ, ramorum brevissimorum reliquis immixtorum ad ex-tremitates terminales, globosæ, rufo-fuscæ, venis anastomos-antibus elegantèr pictæ, orâ valdè contractæ, margine an-gusto, elevato. *Operculum* planum, aut obsoletissimè et obtusissimè umbonatum. *Peristomium* dentibus sedecim obcuneiformibus, luteis, transversìm striatis, semper, quan-tum vidi, clausis, et nunquam vel erectis vel reflexis.

The capsules of this very singular moss have a remarkably contracted mouth, furnished with a narrow elevated margin, below which the operculum is situated; this is nearly flat, hav-ing an elevation in the centre so slight that it does not reach to the edge of the margin. The peristomium, which, on account of its minuteness, is very difficult to examine, has 16 obcunei-form, yellowish teeth placed close together in a horizontal direc-tion, never, as far as I could discern, becoming erect, but re-sembling, in situation as well as in appearance, those of the *Fu-nariæ.* I have given this plant the name of *P. ambiguum*, as I cannot help still regarding it as uncertain to what genus it pro-perly belongs, its terminal sessile capsules, its operculum, and

 its

its whole habit appearing to require that it should ultimately be removed from the *Pterogonia*, with which, on account of its peristomium, it did not appear possible to avoid associating it at present.

TAB. XXVI. Fig. 4.

a. *Pterogonium ambiguum*, natural size.
b. *capsuliferous branch*, magnified.
c. *leaf*.
d. *perichætial leaf*.
e. *capsule*.
f. *operculum*.
g. *peristomium, with the capsule*.

6. DICRANUM *scoparium*. Hedw.

7. POLYTRICHUM *aloides*. Hedw.

8. NECKERA *sphærocarpa*.

Neckera caule pinnato, ramis abbreviatis, foliis ovatis acuminatis mediotenùs uninervibus, capsulis subglobosis subsessilibus secundis.

HABITAT in truncis arborum apud Kargoo. *D. Buchanan*.

Caules bi- tri-pollicares, penduli, ramosi; rami alterni, sparsi, remoti, horizontales, plerumque simplices et breves, longitudine tamen incertæ, paullùm flexuosi, apices versus attenuati. *Folia* undique laxè imbricata; superiora cauli appressa, apicibus tamen sæpiùs subsecundis, ovato-lanceolata, longè acuminata, ad apicem minutissimè serrulata, lutescenti-

tescenti-viridia, basi purpurascentia, inferiora patula, vel sæpè recurvato-patula, ex ovato brevitèr modò acuminata, integerrima, atro-viridia; omnia concava, sed margine juxta basin plano, nervo circiter medium evanescente instructa; *perichætialia* erecto-patula, pallidè luteo-virescentia; interiora majora, oblongo-lanceolata, acuminata, apicem versus subserrata, valdè concava, et aliquantùm crispata, nervo obscuro ante medium evanido; exteriora longè minora, lanceolata, plana, integerrima, et basi tantùm nervo brevissimo instructa. *Capsulæ* ramorum ad latera sitæ, semper secundæ, solitariæ, et plerumque intervallis majusculis sejunctæ, subglobosæ, læves, fusco-lutescentes, orâ incrassatâ, rubrâ, brevissimè pedunculatæ, ut prorsùs sessiles videantur, foliis perichætialibus multò breviores, iisque obtectæ, unde, seorsùm observatæ, *Phasco cuspidato* non sunt absimiles. *Operculum* conicum, acutum, parùm rugosum,釜internè striatum, basi annulo composito cinctum. *Peristomium* duplex, utrumque albicans, et nigro-fasciatum; interius, dentes sedecim filiformes, cum exterioribus, latioribus, brevioribus alternantes. *Semina* magna, sphærica, fusco-viridia, rugosa, quasi pulvere obtecta, quod, si sub lente in aquâ conspiciantur, evidentissimum est. *Calyptra* nondum a me visa.

The affinity of this moss with the British *Neckera heteromalla* is too remarkable to escape notice; and it is most pleasant to the scientific observer of nature to find the artificial system of Genera so confirmed by individuals collected on the trunks of trees in England and in the distant regions of Nepal. The spherical capsule appears, however, a sufficient criterion to distinguish the present species from every other at present known.

Tab. XXVII. Fig. 1.

a. *Neckera sphærocarpa*, natural size.
b. *part of a branch*, magnified.
c. *upper leaf*, magnified.
d. *apex of the same*, more highly magnified.
e. *lower leaf*, magnified.
f. *perichætial leaf.*
g. *apex*, more highly magnified.
h. *capsule and interior perichætial leaf.*
i. *operculum.*
k. *operculum* seen internally with the annulus.
l. *part of the peristomium.*
m. *seeds.*

9. Neckera *flavescens.*

Neckera caule erecto pinnato, ramis simpliciusculis, foliis ovatis enervibus, capsulâ cylindraceâ erectâ, operculo subulato.

Caules tri- quinque- pollicares, erecti, pinnatìm ramosi; rami vagi, plerumque alterni, elongati, paullùm flexuosi, subcompressi, acuti, horizontales, nunc simplices, nunc aliis minoribus similitèr instructi, undique foliosi. *Folia* laxiusculè imbricata, erecta, et cauli appressa, planiuscula, ovata, brevitèr acuminata, prorsùs enervia, lutescentia; summa aureo-fulva; omnia siccitate nitentia, basi reticulata, margine integerrima; *perichætialia* reliquorum similia, sed minora, angustiora, et longissimè acuminata, recurvato-patula. *Pedicelli* in ramis siti, unciales, laterales, læves, erecti, tenuissimi, rufi. *Capsula* oblongo-cylindracea, tenuis, erecta, ru-

fescens,

fescens, pulcherrimè reticulata. *Operculum* capsulæ concolor, eâque dimidio brevius, similitèr reticulatum, e basi conicâ subulatum, obtusiusculum. *Calyptra* cylindraceo-conica, dilutissimè fusca, glabra, nuda, integra secedens.

Among the Neckeræ Bridel enumerates no more than two species which have leaves imbricated on all sides, and upright pedunculated capsules, (*N. curtipendula*, and *N. dendroides*,) both of which are of too common occurrence, and are too easily distinguished, for there to be any necessity of pointing out the differences that separate them from *N. flavescens*, here figured, the name of which I have derived from the colour.

Tab. XXVII. Fig. 2.

a. *Neckera flavescens*, natural size.
b. *part of a branch*, magnified.
c. *leaf.*
d. *perichætial leaf.*
e. *capsule.*
f. *operculum.*
g. *capsule covered with a calyptra.*

10. Neckera *tenuis.*

Neckera caule bipinnato, foliis imbricatis serratis: caulinis cordato-subrotundis basi bistriatis, capsulâ erectâ, operculo incurvo.

Caules procumbentes, repentes, palmares et ultrà, variè flexuosi, cæspitosi, implexi, ramosissimi. *Rami* horizontales, erectiusculi, distichi, vagè pinnati, sub-pollicares, longitudine tamen incertæ, minoribus eâdem ratione dispositis obsiti,

 undique

undique foliosi, siccitate incurvi et crispatuli. *Folia* lutescentia, nitida, laxiusculè imbricata, marginibus ab apice ad medium usque serrata; caulina majora, horizontalia, plana vel paullùm undulata, cordato-subrotunda, brevitèr apiculata, basi obsoletè bistriata; ramea minora, concava, erecto-patula, siccitate magis appressa, ovata, mutica, prorsùs enervia; *perichætialia* albicantia, lanceolata, longè acuminata, reflexa, apice modò serrata. *Pedicelli* in caulibus laterales, sesquipollicares, erecti, tenues, læves, rubri. *Capsula* pedicello concolor, reticulata, erecta, oblonga, orâ contractâ. *Operculum* ejusdem quoque coloris, e basi convexâ rostratum, rostro curvato, capsulâ triplò brevius. *Peristomium* breve, flavum, striatum.

Though I have named this plant from its very thin stem and branches, it has a peculiarity still more remarkable in the twisting of the branches when dry, in which I believe that no other species of *Neckera* participates with it. It belongs to the same division as that last mentioned, and is consequently immediately distinguishable from every other.

Tab. XXVII. Fig. 3.

a. *Neckera tenuis*, natural size.
b. *part of a stem and branch*, magnified.
c. *stem leaf.*
d. *leaf of the branch.*
e. *perichætial leaf.*
f. *capsule.*
g. *operculum.*

11. Bar-

11. Bartramia *fontana.* Hedw.

12. Bartramia *falcata.*

Bartramia caule subdiviso apice falcato, foliis quadrifariis ovato-lanceolatis serratis secundis, pedicellis caulem subæquantibus.

Caules densè cæspitosi, tripollicares et ultrà, nunc simplices, nunc infernè bis ter vagè dichotomi, tomento densò ferrugineo-fusco ad medium longitudinis obsiti, indè foliosi. *Rami* fastigiati, erecti, apicibus insignitèr falcatis. *Folia* lætè viridia, quadrifariam posita, laxiusculè imbricata, erecto-patula, apicibus tamen, præsertim siccitate, secundis, ovato-lanceolata, acuminata, concavo-carinata, margine ubique serrata, pulcherrimè reticulata, nervo valido, fusco, excurrente instructa; *perichætialia* vix discrepant, nisi quòd sint e basi ovatâ in acumen multò longius producta, apice solummodò serrata, et pallidè lutescentia. *Pedicelli* læves, e ramorum axillis caulis infra medium orti, pollicares et ultrà, sed longitudine vix ramos excedentes, fusci, erecti, vel basi flexuosi. *Capsula* globosa, subcernua, fusca, matura sulcata. *Operculum* deest. *Calyptra* integra, cylindraceo-conica, albicans, glabra. *Peristomium* fusco-rubescens.

This very distinct and beautiful species of a beautiful genus is most nearly allied to *B. fontana*, and particularly to the var. *β.* of the plant figured in Mr. Turner's *Muscologia Hibernica* (*t.* 10. *f.* 1.), but it differs in having the leaves more loosely imbricated, always disposed in four rows, with summits slightly incurved, and pointing the same way, as is particularly observable in dried specimens.

specimens. They are also serrated throughout their whole length. Besides this, the ends of the branches are remarkably incurved; which furnishes so strong and obvious a character of the plant that I have derived the specific name from that circumstance.

Tab. XXVII. Fig. 4.

a. *Bartramia falcata*, natural size.
b. b. *parts of the branch*, magnified.
c. *leaf.*
d. *perichætial leaf.*
e. *capsule.*
f. *calyptra.*

13. Bryum *heterophyllum.*

Bryum caule subdiviso, foliis serratis: infimis subrotundis; summis lineari-acuminatis, capsulâ cernuâ, operculo convexo.

Caules cæspitosi, simplices, vel prope basin vagè divisi, unciales et ultra, per dimidiam ferè longitudinem terrâ immersi et aphylli; inde foliosi. *Folia* majuscula, atro-purpurea, margine incrassata, purpurea, serrata, nervo valido purpureo instructa, elegantissimè reticulata, madore erecto-patula, siccitate crispatula. *Foliorum* forma, et nervi longitudo, mirè variant; *inferiora* ovata seu ovato-subrotunda, apice modò minutè serrata, nervo circa medium evanescente instructa; *intermedia* ovato-elliptica, magis evidentèr serrata, nervo infra apicem evanescente; *superiora* longe-lanceolata, argutè serrata, nervo valido excurrente; omnia acuta. *Pedicellus* terminalis, erectus, uncialis, lævis, infernè croceus, supernè rutilans. *Capsula* ovato-oblonga, subcernua, fusca.

Operculum

Operculum capsulâ pallidius, conicum, umbone minuto, obliquo terminatum. *Peristomium* exterius dentibus fusco-flavescentibus, transversìm striatis; interius dentibus membranaceis, flavis, similitèr striatis.

The singularly variable form of the leaves offers so strong a character of this moss that I have derived from it the specific name. In size and in general appearance, when dry, it considerably resembles *Mnium stellare* of Hedwig, near which it must be arranged in the system.

Tab. XXVIII. Fig. 1.

a. *Bryum heterophyllum*, natural size.
b. *upper leaf*, magnified.
c. *intermediate leaf*.
d. *lower leaf*.
e. *portion of the leaf*, highly magnified.
f. *capsule*.
g. *operculum*.

14. Leskea *flexilis*.

L. flexilis. Hedw. *Sp. Musc. p.* 234. *t.* 58

I am induced to offer a figure of the leaves of this very curious moss, the specimens gathered by Dr. Buchanan differing from those figured by Hedwig, in having their leaves furnished at the base with a very evident, though short nerve, and tipped in many instances with a piliform mucro. Dr. Buchanan found it upon trees mixed with *Pterogonium ambiguum*, and, like Dr. Swartz, found it only barren. I have compared the individual

here

here figured with original specimens in Mr. Turner's valuable Herbarium, and find them agree so precisely in every particular, excepting those just mentioned, as to leave no doubt of their identity.

Tab. XXVIII. Fig. 2.

a. *small branch*, magnified.
b. b. *leaves.*

15. Hypnum *proliferum.*

16. Hypnum *Buchanani.*

Hypnum caule procumbente, ramis erecto-patulis, foliis ovatis acuminatis subserratis uninervibus, capsulâ cernuâ, operculo conico obtuso.

Caules bi- tri- pollicares, adscendentes, pinnatìm ramosi. *Rami* erecti, circitèr unguiculares, subdistichi, sparsi, plerumque simplices, sed interdùm repetito-divisi, filiformes, teretes, acuminati, undique foliosi. *Folia* lutescenti-viridia, nitida, undique laxè imbricata, erecta, plana, ovata, longè acuminata, nervo tenui, viridi, ad medium usque percurrente instructa, apices versus subserrata, et apicibus, præcipuè in ramis superioribus, flexuosis; *caulina* majora, latiora, ad basin striata; *ramea* angustiora; omnia elegantèr reticulata; *perichætialia* lineari-lanceolata; longè acuminata, apice torta et reflexa. *Pedicelli* in ramis orti, frequentes, subunguiculares, rufi, erecti, læves. *Capsulæ* rufo-fuscæ, cernuæ, oblongæ, reticulatæ. *Operculum* conicum, obtusum, capsulæ concolor, et similitèr reticulatum. *Calyptra* dimidiata, subulata, fuscella, lævis.—Exemplarium ætas haud satis provecta peristomium investigare vetuit.

I am

I am at a loss to say which *Hypnum* approaches most nearly to that here figured, as it belongs to the division "ramis teretibus," the most numerous and intricate of this immense genus. I flatter myself, however, with the hopes that the figure and character here given will serve to distinguish it from all others. I have named it after Dr. Francis Buchanan, who found all the mosses that form the subject of this paper.

TAB. XXVIII. Fig. 3.

a. *Hypnum Buchanani*, natural size.
b. *part of the branch*, magnified.
c. *stem leaf.*
d. *perichætial leaf.*
e. *capsule, with the operculum.*
f. *calyptra.*

17. HYPNUM *crispatulum.*

Hypnum caule adscendente, ramis erectis aduncis, foliis falcato-secundis lanceolatis serratis uninervibus siccitate crispis.

Caules adscendentes, simplices, vel bis ter dichotomi. *Rami* erecti, apicibus incurvatis, undique foliosi. *Folia* dilutè fusco-flavescentia, nitidiuscula, undique imbricata, laxè disposita, falcata, secunda, oblongo-lanceolata, acuminata, nervo concolore infra apicem evanescente instructa, et striis aliquot longitudinalibus notata; per totum marginem argutè serrata, plana, vel sæpè concavo-carinata, paullùm undulata, siccitate insignitèr crispata. *Fructificationem* non vidi.

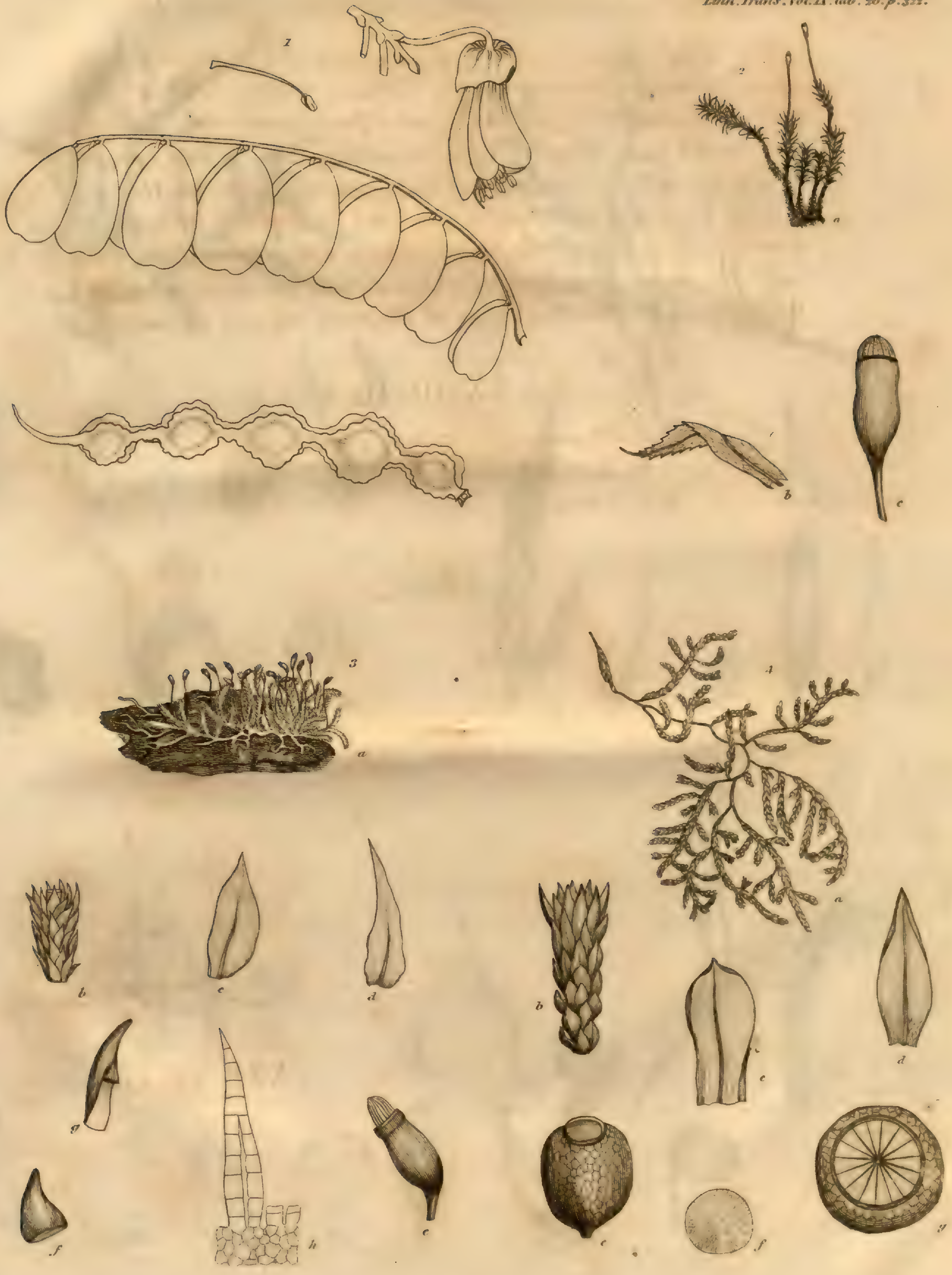
 This

This Hypnum, of which I possess but very imperfect specimens, belongs evidently to the division "foliis reflexis," and appears so different from all the individuals composing that section, that I have ventured upon describing it as a new species. It is nearly allied, both in form and general habit, to *H. rugosum* of *Fl. Brit.* (not *Hedw.*), but may be easily distinguished from it by the form of the leaves, which are considerably more narrow, and by the serratures which extend the whole length of the margin, whereas the leaves of *Hypnum rugosum* are entire

Tab. XXVIII. Fig. 4.

a. *Hypnum crispatulum*, natural size.
b. *part of a branch*, magnified.
c. c. *leaves.*

XXV. Extracts



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XXV. Extracts *from the* Minute-Book *of the* Linnean Society *of* London.

May 5, 1807. Mr. Lambert exhibited a specimen of the single-flowered *Pæonia suffruticosa*, which was then in bloom, for the first time in Britain, in the collection of Lady Amelia Hume.

June 16. A letter to the Secretary from Mr. Power of Market Bosworth, Leicestershire, was read, describing the manner in which the Common Garden Snail *Helix hortensis*, and the Slugs *Limax ater* and *maximus*, feed on the Common Dew Worm or Earth Worm *Lumbricus terrestris*, when dead or dying. This is performed in the night; and as Mr. Power observed these animals would not attack a living worm, he attributes it to the prickles on its surface, which the worm, when in health and vigour, has a power of erecting, as well probably for defence against snails, as for the purpose of drawing straws, &c. into its retreat.

Nov. 17. The following account from Mr. George Milne, F.L.S. respecting the effect of the imagination of a female cat on the fœtus in the womb, was read.

"One afternoon in the month of May last, while myself

self and family were at tea, a young female cat, which, on account of extreme playfulness, had become a great favourite, was lying on the hearth. She was pregnant for the second time, and had arrived, as nearly as I can recollect, at the middle period of gestation. A servant handing the tea-kettle, or doing some office which led her to pass between the fire and the table, trod very heavily on the creature's tail. She screamed most frightfully, and ran out of the room; and from the nature of the noise which she emitted, it was evident that a considerable degree of terror mingled with the sense of injury. But from a circumstance so extremely common no extraordinary result was expected, and the poor cat's tail was no more thought of until the final period of gestation, when we were surprised with the phænomenon which has given occasion to this communication. She dropped five kittens; one of which, exactly resembling herself, was apparently perfect; but the other four had the tail most remarkably distorted. About one third of the length, reckoning from the base, there was a *nodus* equal in size to a very large pea, or about twice as thick as the tail itself; the remaining portion being turned on one side at an angle nearly approaching to a right angle: and what may deserve notice, all of them turned the same way, towards the left side. I was urged to rear one of these as a curiosity; but, conceiving that it might grow up rather a disgusting object, I had the whole destroyed; preserving only the one which appeared to be perfect. That one I kept about a month; when it was seized, as well as the

the mother, with a disorder which greatly enfeebled it; and to save the parent I destroyed the offspring. But it was previously discovered that this also had the tail distorted and turned aside at a considerable angle, although free from the knot which distinguished the other four."

CATA-

CATALOGUE

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Continued from Page 362 of Vol. VIII. of the Society's Transactions.

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---

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627. Barton's (B. S.) Discourse on some of the principal Desiderata in Natural History. Philadelphia, 1807, 8vo.

628. Beroldingen (Von) Bemerkungen auf einer Reise durch die Pfalzischen Quecksilber Bergiwerke. Berlin, 1788, 8vo.

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631. Dancer's (T.) Catalogue of Plants in the Botanical Garden in Jamaica. St. Jago de la Vega, 1792, 4to.

632. Dela Brosse (Guy) de la Nature des Plantes. Paris, 1628, 8vo.

633. De Laet (J.) De Gemmis et Lapidibus. Lugd. Batav. 1647, 8vo.

634. Dillenii (J. J.) Historia Muscorum. Oxonii, 1741, 4to.

538. Dillwyn's (L. W.) Synopsis of British Confervæ. Fasc. 12—13. London, 1807, 4to.

635. Dioscorides De Medica Materia. Frankf. 1543, fol.

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637. ———— sur une nouvelle Espece de Tarsier. Mayence, 1802, 4to.

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Gadolin (M. J.) Dissertationes Academicæ. Aboæ, 1805, 4to.

638. De Alumine.

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642. ———— Magnesiæ.

643. ———— Ammoniacæ.

644. ———— Ammoniacæ et Magnesiæ.

645. ———— Sodæ.

646. Gallizin (Le Prince de) Dictionnaire de Mineralogie. Brunsvik, 1802, fol.

647. Hayne et Willdenow Termini Botanici, 4 fasc. Berlin, 1799, 4to.

648. Hosack's (D.) Catalogue of Plants in the Botanic Garden at Elgin, near New York. 1806, 12mo.

649. How (G.) Phytologia Britannica. London, 1650, 12mo.

650. Latreille (A. P.) Genera Crustaceorum et Insectorum, 3 tom. Paris, 1806—7, 8vo.

651. Lacepede Histoire Naturelle des Poissons, 4 tom. Paris, 1798, 4to.

652. Martin (J. de S.) Traité de la Culture du Chene. Paris, 1788, 8vo.

301. Martyn's (T.) Gardener's and Botanist's Dictionary, by the late Philip Miller, corrected and newly arranged, with Additions. Part 22.

653. Neill's (P.) Tour in Orkney and Shetland. Edinburgh, 1806, 8vo.

654. Panzer (G. W. F.) Symbolæ Entomologicæ, fasc. 1. Erlangæ, 1794, 4to.

655. ———— Quædam de J. G. Volcamer. Norimbergæ, 1802, 4to.

656. Power's (J.) Calendar of Flora at Market Bosworth for January 1807. Hinckley, 4to.

657. Scheuchzer (J. J.) Specimen Lithographiæ Helveticæ. Tiguri, 1702, 12mo.

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658. Smith's (J. E.) Sketch of a Tour on the Continent. 2d edition. 3 vols. London, 1807, 8vo.

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663. Thunberg's (C. P.) Characteres Generum Insectorum, ed. F. A. Meyer. Gottingæ, 1791, 12mo.

438. Philosophical Transactions of the Royal Society of London for 1753—8, 1778 and 1807. London, 4to.

664. Memoirs of the American Academy of Arts and Sciences, vol. 1. Boston, 1785. vol. 2. part 1. Charlestown, 1804, 4to.

665. Transactions of the Horticultural Society of London, vol. 1. part 1. London, 1807, 4to.

666. Memoires de l'Academie de Dijon, 2 tom. Dijon, 1769 and 1774, 8vo.

667. Memoires de l'Academie Royale de la Rochelle, 2 tom. Paris, 1747 and 1752, 8vo.

668. Journal des Mines, No. 1—53. Paris, 1795—9, 8vo.

669. Catalogus Horti Botanici Turicensis. 1776, 8vo.

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William Spence, Esq. F.L.S. 660.

Directions for placing the Plates of the Ninth Volume.

Tab.	Subject	to face page
1.	Apion	80
2.	Cancer floridus, &c.	
3.	Cancer subterraneus, &c.	
4.	Cancer Locusta, &c.	
5.	Cancer rubricatus, &c.	114
6.	Bulla Hydatis, &c.	
7.	Doris longicornis, &c.	
8.	Amphitrite Infundibulum	
9.	Ursus indicus	116
10.	Variolaria multipuncta & V. globulifera	137
11.	Lecidea aromatica & L. atro-flava	140
12.	Parmelia velata & P. carneo-lutea	143
13.	Parmelia Clementi & P. Borreri	147
14.	Lycium rigidum	153
15.	Lycium tetrandrum	
16.	Lycium cinereum	154
17.	Lycium horridum	
18.	Insect that destroys the Wheat	159
19.	Didelphis cynocephala & D. ursina	174
20.	Dimorpha grandiflora	180
21.	Piper quadrangulare & P. bracteatum	202
22.	Nauclea Gambir	218
23.	Hookeria	277
24.	Notoclea	294
25.		
26.	Edwardsia chrysophylla, Splachnum squarrosum, &c.	
27.	Neckera sphærocarpa, &c.	322
28.	Bryum heterophyllum, &c.	

END OF THE NINTH VOLUME.

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